ARCHIVES

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VOLUME XXVI

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ARCHIVES OF OPHTHALMOLOGY

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The ARCHIVES OF OPHTHALMOLOGY contain *original papers* on all branches of ophthalmic surgery, and *original reports* on the progress of ophthalmology. The original papers occupy from two thirds to three fourths of the space, and their scope embraces all subjects of scientific and practical interest connected with this department of medicine.

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Original papers of value from any source will, as heretofore, be welcome to the ARCHIVES, and are solicited.

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ARCHIVES OF OPHTHALMOLOGY.

THE RELATION BETWEEN THE LENGTH OF APHAKIC EYES AND THEIR APPROPRIATE CORRECTING GLASSES.

By ARCH'D STANLEY PERCIVAL, M.A., M.B., Cambridge,
OPHTHALMIC SURGEON TO THE CHILDREN'S HOSPITAL, NEWCASTLE-ON-TYNE.

MANY of the formulæ employed in ophthalmic practice are misapplied from a want of knowledge of the conditions on which they are based. In this paper I wish to draw attention to one formula the improper application of which has given rise to serious error. In the estimation of axial ametropia, of swelling of the fundus, or of the depth of a posterior staphyloma, we are all in the habit of using the convenient formula that a difference of 3 D corresponds to a difference of level of 1 *mm* in the fundus. If, for instance, when the surgeon is emmetropic, and the curvature of the patient's cornea is normal, the optic disc is seen distinctly with + 1 D behind the sight-hole of the ophthalmoscope, and a certain part of a retinal vessel is seen distinctly with + 12 D behind the sight-hole, the surgeon is justified in drawing the conclusion that the optic disc lies $\frac{1}{3}$ *mm* in front of its normal position and that the retinal vessel lies 4 *mm* in front of its normal position, or $3\frac{2}{3}$ *mm* in front of the level of the optic disc. If, however, the crystalline lens has been removed this conclusion is erroneous, as the dioptric system of the eye is in that case entirely different.

It will be convenient to consider the conditions on which this rule-of-thumb formula is based, and we shall be at once led to find the proper relation between the the length of an aphakic eye and its appropriate correcting glass.

If we take as our standard the simple reduced eye of Donders, in which the complex dioptric system of the eye

is considered to be practically represented by a single spherical surface, whose radius of curvature is 5 *mm*, whose first principal focal distance f_1 is 15 *mm* in front of the cornea, the second principal focal distance f_2 being behind the cornea -20 *mm*, we get from the familiar formula

$$(p - f_1)(q - f_2) = f_1 f_2$$

the relation between the conjugate focal distances p and q. Here p represents the distance of the punctum remotum from the cornea, and q denotes the distance of the retina from the cornea, or the antero-posterior diameter in the reduced eye. Since q is measured behind the cornea it is of course a negative quantity.

Also if the eye be axially ametropic, $p - f_1$ denotes the focal distance of the glass necessary to correct the ametropia when it is placed at the first principal focus of the eye.

$$p - f_1 = \frac{f_1 f_2}{q - f_2} = \frac{(15)(-20)}{-l} = \frac{300}{l}$$

where l represents the excess or defect in length of the eye in millimetres.

Thus, suppose the eye be 3 *mm* too long, $l = +3$ *mm*

$$\therefore p - f_1 = \frac{300}{3} = +100 \text{ mm}$$

A lens, therefore, the focal distance of which is $+100$ *mm* (or -10 D lens) will be required to correct this eye for distant objects.

If x denote the power in dioptres of the correcting lens placed at the first principal focus of the eye

$$\frac{1000}{-x} = p - f_1 = \frac{300}{l}$$

$$\therefore l = -\cdot 3\, x \text{ and } x = \frac{-l}{\cdot 3} *$$

Now in an aphakic eye if the corneal curvature is normal ($r = -7.829$ *mm*) $f_2 = -31.095$ *mm* $f_1 = 23.266$ *mm*.

$$\therefore p - f_1 = \frac{f_1 f_2}{q - f_2} = \frac{(23.266)(-31.095)}{-l'} = \frac{723.455}{l'}$$

* If the complex dioptric system of the eye be taken into account, a more accurate expression for the power (x) of the correcting lens 13·7451 *mm* in front of the cornea is given

where $x = \frac{-l}{\cdot 321} = -3.115\, l$, and $l = -\cdot 321\, x$

where l' represents the excess or defect in length of the eye above or below 31.095 *mm*, which is the antero-posterior diameter of the emmetropic aphakic eye.

And $p - f_1$ denotes the focal distance of the correcting glass placed at the first principal focus of the eye required to correct this excess or defect. If X denote the power in dioptres of the correcting glass placed at the first principal focus of this aphakic eye

$$\frac{1000}{-X} = p - f_1 = \frac{723.455}{l'}$$

$$\therefore l' = -\cdot 723455\ X, \text{ and } X = \frac{-l'}{\cdot 723455} = -1.38226\, l'$$

If an eye of normal length (22.8237 *mm*) be rendered aphakic by the extraction of its crystalline,

$$l' = 22.8237 - 31.095 = -8.2713\ mm$$

The correcting glass for distance after the operation will be

$$X \text{ or } (-1.38226)(-8.2713) = +11.5\ D$$

if placed about 23 *mm*, in front of the cornea. A neuritis which in an aphakic eye causes + 3 D of swelling, would represent a displacement forwards of about 2.17 *mm*, whereas in a normal eye + 3 D of swelling would indicate a displacement of barely 1 *mm*.

Again suppose a myopic eye be 31.1 *mm* long,

$$l = 31.1 - 22.8 = +8.3\ mm\ ;\ x = -3.115\ l = -25.85\ D$$

Thus a myope who has been using — 25 D or — 26 D glasses may be expected to see without glasses if his crystalline lens is removed. Surprise has often been expressed at the very great change in refraction after extracting the lens in myopic cases. It will be noticed that the change in refraction due to the operation increases with the previous degree of axial myopia.

Ant.-Post. Dimension.	x	l	l'	X	Change of Refraction.
23 *mm*	− ·5 D	+ ·1763	− 8·095	+ 11·2 D	11·7 D
26 *mm*	− 9·9 D	+ 3·1763	− 5·095	+ 7· D	16·9 D
29 *mm*	−19·2 D	+ 6·1763	− 2·095	+ 2·9 D	22·1 D
32 *mm*	−28·5 D	+ 9·1763	+ ·905	− 1·25 D	27·3 D

This point is of considerable importance to those who

treat high degrees of myopia by the extraction of the transparent lens. If the result of the operation does not correspond with this table, it is certain that the myopia was not purely axial in character. Incidentally I may point out that in aphakic eyes provided with the necessary correction 23 *mm* in front of the cornea, the retinal images are 1.5 times larger than in normal eyes. This is distinctly advantageous to the patient but should warn us against forming too favorable a view of his visual acuity when examining him with test types.

I lay no claim to any originality in the formulæ here given. They follow immediately from the data which may be found in the standard books on physiological optics, such as those of Helmholtz, Donders, and of Landolt. The numerical values of the constants used in this paper are those given by Landolt. The frequency of error arising from an improper application of the rule about normal eyes to the length of aphakic eyes justifies, I trust, this brief reference to the essential difference between the two conditions.

THE GRADUATION OF THE SQUINT OPERATION.

By Dr. EDM. LANDOLT, Paris.

Translated from MS. by Dr. C. Zimmermann, Milwaukee, Wis.

THIS article was suggested by the discussion on the same subject at this year's meeting of the British Medical Association (at Carlisle) in which I had the honor to participate. Dr. Maxwell, of Dublin, opened the discussion with his very interesting paper, from which I received the impression that the so-called classical rules for graduation in squint operations can hardly be further maintained. In my opinion, we cannot speak of obtaining a certain effect by graduation in squint operations, until the nature of strabismus and the action of the operation for it are better understood. For even our knowledge of the physiology and anatomy of the ocular muscles is still insufficient. According to the theory of Donders, which is no doubt correct, concomitant strabismus is a *binocular* affection. Measurements of the ocular movements, as well as the direct inspection of the muscles during the operation, have showed that in strabismus *convergens* both *external* recti muscles and in strabismus *divergens* both internal recti have grown weaker, probably from want of proper use. This seems to call for *strengthening* the action of the weakened muscles in correcting the deviation, instead of weakening one or two healthy muscles by tenotomy: advancement of the external recti in strabismus convergens, and advancement of the internal recti in strabismus divergens. Nevertheless, tenotomy is still much in vogue, because it is easier than advancement, and especially

because the effect of the two operations is not yet clearly understood. The centre of rotation of the eyeball has been supposed to be immovable, so that after tenotomy the eye must turn about the centre in an opposite direction, and after advancement in the direction in which the muscle acts. Thus the result of either operation was held to be materially the same, viz., decreased mobility in the direction toward the tenotomized muscle or in the direction away from the advanced muscle, and increased mobility in the direction of the advanced muscle and in the direction of the rectus antagonizing the tenotomized muscle.

This view, however, is incorrect. The centre of rotation is by no means a fixed point in space, but its location is due to the resultant effect of all the forces which hold the eyeball in position and which move it. Of these forces, some, such as the recti, retract the eyeball, while others, holding these in check, draw the eyeball forward. If the action of the former is weakened as by tenotomy, the latter gain ascendency and draw the eyeball forward. For this reason the tenotomized muscle re-attaches farther back on the ball. This retraction of the insertion of the muscle is, however, in greater degree due to the rotation which the eyeball undergoes from the contraction of the antagonist muscles. We also do not take sufficiently into account the fact that the tenotomized muscle itself contracts more than its antagonist since it is stronger. This is the third reason why the new insertion of the tenotomized muscle falls far behind the normal insertion, thus lessening its effect on the mobility of the eye.

The effect of the muscle is lessened, however, from still another reason. The measurable excursions of the eyeball, the borders of the field of fixation, do not, as supposed, represent the total rotation which the muscles can impart to the eyeball. Their contraction is actually interfered with by strips of connective tissue ("check-ligaments," "*Hemmungsbänder*" "*ailerons*," "*tendons d'arrêt*") which arise from them and run toward the orbital margin. These ligaments follow the muscle. After tenotomy the ligament recedes also. Thus its checking influence will set in earlier.

From all these considerations it may readily be conceived how much the mobility of the eyeball must suffer after tenotomy. The diminution of the ocular movements is revealed by the contraction of the field of fixation and the lessened range of convergence. Indeed the success of tenotomy depends on the decreased mobility, as is conceded by the advocates of this operation.

They are deceived, however, first, in regard to the effect of tenotomy on the antagonist muscle, since they think that the antagonist gains what the tenotomized muscle loses, which is not the case. From the exposition of the mechanism of tenotomy given above, it follows that the antagonist never gains, if it gains at all, as much as the divided muscle loses. The eye, by the operation, is drawn forward out of the muscle cone, so that the muscles embrace it less than before. Therefore their influence upon rotation is lessened, as may be proven by measuring the excursions and the symmetrical movements of the eyes after tenotomy. Secondly, the assumption is wrong, that advancement has the same effect, and that it is therefore open to the same objections as tenotomy. On the contrary, advancement forces the eye deeper into its motor apparatus and the muscles embrace it more extensively. With the resulting increased contact the effect of the muscles on the mobility of the eyeball is increased. The check-ligament is advanced also with the muscle, and its checking action comes more into play. The field of fixation shows a considerable extension on the side of the advanced muscle, *without limitation* on the side of the antagonist. This is not surprising, since the latter remained unchanged. The opinion is general that a muscle loses power if its antagonist gains power, from the increased resistance of the latter. This resistance does not become active except through contraction of the muscle, which follows an impulse of innervation. Suppose the left externus to have been advanced. In looking to the right the internus is chiefly innervated and the externus relaxed, so that the function of the internus is perfectly free, the increased power of the externus being only perceived in the movement to the left. Thus the convergence increases after advance-

ment of the internal, the divergence after advancement of the external muscles, without limiting the function of the antagonists. Herein lies the advantage of advancement over tenotomy. In twenty years' practice we have never had an over-correction after advancement, which is frequent after tenotomy. We have never produced a strabismus, which can hardly be avoided after tenotomy, at least in the secondary position. The advancement has also the cosmetic advantage of not causing annoying protrusion of the eyeball, sinking of the caruncle, or exposure of the sclera. So much for strabotomy in general.

As to the graduation of its effect, we meet with many errors and illusions. We can hardly regulate the re-insertion of a divided or advanced muscle on the globe, nor does the action of a muscle depend merely upon its attachment to the eyeball. For we learn from daily observation, that the effect of an operation on the mobility of the eye and the synergy of both eyes, *i. e.*, the correction of the strabismus, may be very different. We cannot graduate the effect during the operation. Nature does it: with us, if we make use of its efficient help; against us, if we neglect it. In the first place, the operation aims at the removal of an impediment, which nature alone cannot effect. But this is not all. We must resuscitate, strengthen, and make use of the powers and influences by which nature regulates the associated movements of the two eyes, *viz.*, the association of convergence and accommodation, but principally *binocular vision.* In our opinion, the operation is only a stage in the complicated treatment of strabismus. The treatment must be governed by exercises for attaining binocular vision. Mydriatics, spherical, cylindrical, and prismatic glasses, and exercises for convergence and divergence are also useful for regaining a harmonious action of both eyes. Graduation in squint operations is effected by optical and orthoptic treatment. It is not possible during the operation, in which we must confine ourselves, to proceed more energetically, *e. g.*, to shorten the advanced muscles of both eyes by resecting the tendon in strabismus of high degree and long duration with little disposition toward binocu-

lar vision. (In the highest degrees a moderate tenotomy may become necessary some weeks or months after these two operations.) In strabismus of moderate degree, the muscles of both eyes must be advanced as far as possible without resection and tenotomy. The advancement of the muscle of one eye is scarcely sufficient in manifest strabismus; but the operation on the second eye may be postponed until the effect of the first operation has become permanent. Insufficiency of divergence, and particularly of convergence, is generally cured by unilateral advancement, when non-operative treatment does not suffice.

I have written much about the advantages of muscular advancement, and little in regard to my method of operating, since the success of the operation does not depend on its details, and since I wanted to avoid narrow discussions on such an important question as the principles of squint operation. If the insertion of a severed muscle is permanently brought as near to the cornea as possible, our aim is obtained. This can be done by more than one method.

The following is my method as practised at present, although I do not consider it the only right one, and I constantly strive to improve it. Conjunctival incision close and parallel to the corneal limbus. No conjunctival bridge for a meridional suture is left, since the muscle then generally becomes re-inserted not at the corneal margin but farther back, corresponding to the conjunctival incision. The conjunctiva is not detached far beyond the tendon. A small and somewhat flattened hook is passed under the muscle, either according to von Graefe's method or, better, after grasping the muscle with a pair of forceps[1] and cutting a small hole. In this manner the whole muscle is brought flat on the hook, whereas in the first mode the relaxed muscle may be folded or the hook may become entangled in Tenon's capsule or the muscular fibres. An assistant now draws the muscle forward and away from the globe with the hook, and the operator with the squint forceps grasps the muscle at a point about one third of its breadth from its margin, together with the

[1] I use a toothed forceps, the teeth placed obliquely to the axis (2 : 1).

surrounding connective tissue and Tenon's capsule, *behind* the hook, and then passes a fine curved needle through this entire fold. After this is done on both sides of the muscle, it is pulled up by the four threads and cut between the threads and the hook. The tendinous stump is detached close to the eyeball. This is a small resection, which enhances the effect of the advancement in moderate degrees of strabismus. In simple insufficiency or small degrees of strabismus, the muscle is detached without resection. In strabismus of high degree, the sutures are introduced far behind the insertion for a more extensive resection. This done, the operator sees if the sutures are well applied. If they are not, he re-applies them, which is very easy, since the inferior surface of the muscle is now exposed. Then one needle is passed a few *mm* through the episcleral tissue, close to the corneal limbus, above, while the other is passed similarly below, the muscular plane. The assistant grasps the eyeball over the antagonistic muscle with a fixation forceps and rotates it toward the muscle to be advanced. Thus the operator can tie both sutures without much traction on the enclosed tissues. It is advisable to half tie both sutures before completely tying one. Thus the preponderance of the first suture over the second is avoided. To prevent confusion, white silk is used for one and black silk for the other suture.[1] The muscle, with its covering conjunctiva, not unfrequently rests upon the corneal margin, where, of course, it cannot insert. If the advanced piece should encroach far on the cornea, it may be divided by a cut into two halves, as I have done it for years, and both halves will then lie at the corneal margin. Generally the advanced muscle retracts enough to furnish a more favorable insertion. After the sutures are tied, the eyes are irrigated with an aseptic solution and both are bandaged. In convergent squint the effect of the operation is increased by paralysis of accommodation. Therefore atropine is instilled into both eyes, as long as there is any tendency to convergence. Exclusion of light, rest, and occlusion of the eyes have the same

[1] The silk, No. 1, of C. F. Hartmann, in St. Gallen, Switzerland, seems to be very good. It is sold in sterilized tubes which are very convenient.

effect. The binocular bandage remains at least five days, for the healing of the wound. In convergent squint it is re-applied for several days more, for the above reasons. Then it is replaced by correcting convex glasses. The sutures need hardly ever be removed before the sixth or seventh day. In divergent squint, accommodation and convergence assist the operation. As soon as the advanced muscles are firmly attached, one eye is left free. After one or two weeks the methodical exercise of convergence may be commenced. Some colleagues, who acknowledge the advantages of muscular advancement, complain that frequently the sutures cut through. In such cases the sutures have not been passed deep enough into the episcleral tissue. Or it may be the fault of the patient, who should lie quiet in bed for at least six days. Persons operated on for squint cannot be allowed to walk about. I think that every strabotomy, during the first days at least, requires a binocular bandage, rest in bed, and careful watching by the oculist and the attendants. It must be borne in mind, that the healing of squint is not so easily attained as some authors assert even at the present time. Then we need not be discouraged, as was an esteemed and experienced European ophthalmologist of the old school, who, at the International Congress at Washington, said that he had entirely given up the squint operation on account of the bad results he obtained.

PHLEBOLITH OF A VARIX OF THE CONJUNCTIVAL VEINS.

By SWAN M. BURNETT, M.D., Ph.D., Washington, D. C.

(*With two figures in the text.*)

A PLUG in the cavity of a varicose vein with a deposit of calcareous or other earthy material in it, is known as a *phlebolith*. These bodies seem not to be very common in any part of the body, for by some authors they are not mentioned at all. Among the latest text-books in English I find the following references:

—Chiefly met with in the veins of the genitals of the pelvis, genital organs, and lower extremities.—Ashurst, 1893.

—Are unusually small and are formed most often in the clots lying behind the valves of varicose veins and in the branches of the pelvic plexus of veins.—Treves, 1895.

—Small rounded and often pedunculated masses enclosed in a fibrous sheath, and consisting mainly of phosphate of lime with small quantities of sulphate of lime and potash.—Moullin, 1893.

—Small hard concretions which have been called vein-stones or phleboliths have been observed.—American Text-Book of Surgery, 1895.

I have not been able to find any reference to them, in any of the more recent text-books on ophthalmology, as occurring in the eye. In fact, varices of the veins on and around the eye are not themselves common; I have seen only three or four in about twenty thousand recorded eye cases. Those

I have observed I have not been able to refer to any particular cause, and all the patients stated that they had been accidentally discovered long before presenting themselves for treatment.

In two cases it was affirmed that a gradual enlargement had been noted recently. Pressure from before backwards always emptied them; and a ligature applied at the base has sufficed to cure the cases which submitted to treatment.

The third case, however, was distinguished by features that have led me to report it in detail:

Mrs. S. E. S., a white married woman of thirty, presented herself on December 18, 1895, with a large varix of the conjunctiva occupying the cul-de-sac and running up on the conjunctiva of the ball to within a few millimetres from the corneal edge. She had first observed it thirteen years ago. It had remained stationary until within the last few months, since which time it has seemed to enlarge some. She had never had trouble of any kind with the eye. The relative size and position of the mass are shown in Fig. 1. In this case, I determined to attempt to dissect out the mass

FIG. 1.—The largest white spot on the temporal side marks the site of the larger phlebolith.

of veins with a view to examine its histological structure in detail. In this I was, however, only partially successful, for on examining it more carefully and attempting to evacuate it by pressure, I found a hard resisting body which prevented a collapse of the tumor. However, I proceeded with the dissection, and removed two solid bodies,—one oblong, 8 by 6 by 4 *mm*, the other almost globular, 1 *mm* in diameter. Both had perfectly smooth surfaces,

and felt as hard as shot under the finger. On their removal the tumor collapsed completely. The conjunctival wound was brought together with a single fine suture. It healed readily, and in a few days there was no trace of it remaining.

The larger body was decalcified and cut by Dr. Gray at the Lionel Laboratory of the Emergency Hospital. A section is shown in Fig. 2. Its lamination is so regular as to lead

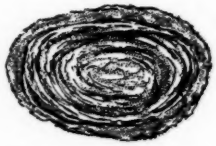

FIG. 2.—Section of phlebolith, magnified three diameters.

one to think at once of a crystalline lens; and the idea is further carried out by its slope and a distinct capsule. The lens in that eye, however, was in place, and, besides, a careful examination shows essential distinction between the two. The capsule is much thicker than that of the lens, and the laminæ of the lens are not so continuous in any one section.

Why there should be a varix of the conjunctival vessels at all in a healthy eye is difficult to explain, since the conditions of over-pressure from gravitation and other large organs in its immediate vicinity, and which seem to be active factors in the production of varices elsewhere, are almost wholly absent. It seems most probable that they are congenital at the beginning, with an increase with advancing years. Given a dilated vein, however, with its retarded flow of blood, the formation of a plug by successive deposits of fibrin is easily understood, and its calcareous degeneration we know to be a natural sequence. The capsule of these masses I take to be the walls of the vein the lumen of which has become obliterated by the gradually encroaching mass.

A CONTRIBUTION TO THE STUDY OF MOLLUSCUM CONTAGIOSUM OF THE EYELIDS.[1]

By Dr. H. MUETZE, St. Louis, Mo.

(With two drawings, Plates XVI. and XVII., Vol. XXXIII., Germ. Ed.)

IT is not my intention to enter into a very minute description of the clinical symptoms of this so well-known tumor, as the subject has been thoroughly exhausted in the text-books and monographic literature of dermatology. If, however, I undertake to make a few remarks in an ophthalmological journal, it is because I regard molluscum contagiosum of special interest to the ophthalmologist. I seize the opportunity of considering this affection from a clinical as well as histological standpoint particularly, as the recent correspondence, between Steffan[2] and de Wecker,[3] has left the impression that molluscum contagiosum might not be as well known in ophthalmological circles as it really deserves.

Although molluscum contagiosum is briefly mentioned in the text-books of ophthalmology, yet a more accurate description of it is mostly wanting. Neither have I been able to find perfect microscopical illustrations in our literature. Fuchs[4] only gives a drawing of a tumor, designated, "Adenoma of the sebaceous glands," which seems to me identical with molluscum contagiosum. It may be sufficient to state that this benign, epithelial, mostly multiple tumor, which is not so very rare at all, may occur anywhere in the skin. It is found principally, however, on the genital organs and sur-

[1] From the Eye Clinic of the University of Marburg, Germany.
[2] *Klin. Monatsbl. f. Augenheilk.*, vol. xxxiii., p. 457; vol. xxxiv., p. 66.
[3] *Klin. Monatsbl. f. Augenheilk.*, vol. xxxiv., p. 64.
[4] Fuchs, *Arch. f. Ophthalm.*, xxiv., 2, p. 158, 1878.

rounding parts and in the face. In the latter, the *especial seat of predilection is the eyelid or the margin of the same.* Frequently the little tumor situated on the margin of the lid is so small as to be easily overlooked, and occasionally it is confounded with a simple wart, etc. Simon and Lewin[1] justly claim, that he who knows molluscum contagiosum is able to find it *frequently.* Even macroscopically, it is easily differentiated from tumors of the sebaceous glands (Milium, Atheroma, Retention cyst). Rarely larger than a pea, somewhat reddened at the base, otherwise of a whitish color, it forms a round elevation with the skin, which is stretched tightly over it. It is umbilicated and has a central aperture, from which on lateral pressure a gruel-like mass is evacuated, containing the so-called molluscum corpuscles. These corpuscles are considered by some to be the carriers of the contagium. For further information, I should like to refer to the text and illustrations in Hebra's *Atlas*[2] and to the description given by Simon and Lewin (*l. c.*) in *Eulenburg's Realencyclopaedia.*

As molluscum contagiosum does not occur so very rarely on the lid or the margin of the lid, it frequently is the cause of conjunctival catarrh, which defies all non-surgical treatment, as Steffan (*l. c.*) pointed out correctly in referring to Peters's[3] article on the subject. After removal of the tumor, the catarrhal trouble disappears, as we shall see from our three cases, reported farther on.

Now, whether molluscum contagiosum, situated on the margin of the lid, produces a local irritation in the conjunctiva, or whether the catarrh is due to the secretion of the tumor, possibly rubbed into the conjunctival sac by means of the fingers, cannot be decided at present. Both might be possible.

The contagiousness of this tumor was justly presumed by Bateman,[4] who first described it as molluscum contagiosum. Recently the truth of this supposition has been confirmed

[1] Simon and Lewin, *Eulenburg's Realencyclopaedia*, vol. xiii.
[2] Hebra, *Atlas d. Hautkranhh.* Text, p. 81 ; vol. vii., pl. x., Vienna, 1856.
[3] Peters, "Zur Behdlg. d. Bindehautkatarrhe Klin.," *Monatsbl. f. Augenheilk.*, vol. xxxiii., p. 370.
[4] Bateman, *Delineation of cutaneous diseases, etc., of the late Dr. Wilson*, London, 1817.

by experimental tests, as well as clinical observations. By intra-epidermoidal inoculations with the contents of molluscum contagiosum, Pick,[1] for example, produced the typical tumor in a boy and a girl after a period of incubation of ten weeks. After three to four months it had attained the usual size. Csokor[2] experimented successfully in a similar manner.

During two epidemics of molluscum contagiosum occurring on Staten Island, Mittendorf[3] made observations which prove the contagiousness of the affection beyond any doubt. Additional proof of the contagiousness of this disease is furnished in one of our cases by the anamnesis in such a drastic manner, that I cannot refrain from giving the exact history of this case first.

1. The patient, L. Apollonia, thirty-nine years of age, presented herself at the Marburg Eye-Clinic April 27, 1896, for the first time. Last year she was *nursing a sick child, which had a number of nodules on the right eye* since winter 1894–95; these were removed successfully in May, 1895. The child embraced and kissed her frequently, and four to six weeks after the child had taken ill, patient noticed *two little nodules at the margin of both lids of her left eye.* The nodules were situated precisely at the point of contact of both margins and continued to grow very slowly.

In August they were extirpated, and while the lower one never returned, the upper one gradually began to grow again until it attained the present size. Patient had a sensation of pressure and heaviness in the left eye; also lachrymation, and very frequently the lids were glued together. No nodules anywhere else on the body.

Stat. Præs.—General health good. Right eye normal. Left eye: On lower lid no distinct scar. At intermarginal portion a round whitish tumor, about the size of a pea, covered by skin, umbilicated and with central opening, from which, on lateral pressure, a gruel-like mass exudes. The little tumor is very

[1] Pick, "Ist Mollusc. contag. contagios.?" *Verhldg. d. deutsch. dermat. Gesellschft.*, 2d and 3d Congr., 1893, p. 89.

[2] Csokor, "Ueber Epithelioma contag. des Geflügels," *Wiener med. Presse*, 1883, p. 446.

[3] Mittendorf, "Two Epidemics of Mollusc. Contag.," *Trans. of the Amer. Ophth. Soc.*, 22d meeting, New London, p. 262, and *Amer. Jour. of Ophth.*, p. 298.

sharply defined, and the lashes have been forced aside by it. The skin is only slightly reddened ; the conjunctiva a great deal more so. No similar formation on face and neck ; only a few comedones. Extirpation of the tumor.

2. The second case concerned a twelve-year-old boy, who had been suffering with severe conjunctival catarrh in his right eye for several weeks. No knowledge of any possible contagion.

Stat. Præs.—In the centre of the margin of the right lower lid there is a prominent, sharply defined, superficial tumor about the size and form of a split pea. It is umbilicated, situated closely under the skin, with which it is continuous in the centre, showing here a small opening, from which, on pressure, the gruel-like contents are evacuated. A number of similar small tumors are on forehead, cheeks, and chin in different stages of development. Lower conjunctiva considerably congested and swollen ; partial ectropion.

No improvement by three weeks' treatment with the usual remedies ; immediate disappearance of the catarrhal trouble, however, after extirpation of the tumor.

3. The third case was that of a young man twenty years of age with a small tumor on the right upper lid. In this case also the troublesome conjunctival catarrh subsided only after removal of the tumor. There are several smaller tumors in the skin of forehead. By these three cases, therefore, we prove that, as we assumed above, molluscum contagiosum *is liable to produce conjunctival catarrh of varying intensity, which only yields to the removal of the tumor.*

HISTOLOGICAL EXAMINATION.

The contents pressed out of the tumors contained, besides horny epithelial scales, numerous oval, strongly light-refracting, sharply defined corpuscles, partly grouped in a honeycomb-like framework, partly free. These proved very resistent to reagents.

The tumors themselves were hardened partly in corrosive sublimate solution and subsequently treated with iodine-alcohol, partly in a ten-per-cent. solution of formol, and afterwards imbedded in paraffine with melting point at 40° R. The sections of 10–15 μ were stained with borax-

methylene-blue and hæmatoxyline-eosine. With borax-methylene-blue the normal cells stained intensely blue, the partly degenerated cells considerably less so, and the totally degenerated cells (molluscum corpuscles) did not take any stain at all. With hæmatoxyline the nuclei and cornified cells stained dark blue; as a counter-stain eosine was used, which colored the normal-cell protoplasm pink, the partly degenerated cells a little darker, and the totally degenerated cells (molluscum corpuscles) assumed a dark red color.

FIG. 1 (Leitz Obj. 2, Ocular 3. Tube length 170 *mm*).—This illustration represents a longitudinal section through the centre of the tumor, stained with borax-methylene-blue. It is of a somewhat round, lobular, gland-like shape, and surrounded by a pretty tense connective-tissue capsule. The latter sends processes or septa irregularly into the tumor. Some of these septa can be traced close up to the central aperture; others, being cut transversely, are closed and in this manner a peculiar lobulated appearance is imparted to the whole. To judge from the present section, we therefore must assume that the tumor is imbedded in a number of connective-tissue pockets of different size, which take their origin from the thick connective-tissue capsule and extend into close proximity of the central opening. In this tense connective tissue we find numerous leucocytes, especially in the neighborhood of the transversely cut blood-vessels and the papillæ. On both sides of the section there is surface epithelium, the lowest layers of which are directly continuous with the lower epithelial layers of the tumor, whereas the upper layers, running farther forward, are lost in the interior of the central aperture. In entering the tumor from without we notice, on the connective-tissue capsule and the septa arising therefrom, several layers of normal surface epithelium, which towards the centre of the tumor gradually loses its characteristic properties. The individual cells, in the beginning stained dark blue and regular, are arranged more irregularly and have assumed a lighter tinge; with the exception of the nuclei, however, which appear normally stained and crowded to the periphery. Besides, the cells are larger and of various shapes. The farther we follow them to the centre, the larger and lighter they are; the nuclei remain visible in crescent form in the periphery. Finally we find them oval and colorless in the central aperture, imbedded in an intercellular substance.

This transition, *i. e.*, the development of the molluscum corpuscles, can be studied to greatest advantage in Fig. 2 (Leitz Obj. 7, Ocular 1. Tube length 170 *mm*).

This illustration represents a longitudinal section through a lobe of the tumor, stained with hæmatoxyline-eosine. Within, the lobe is covered by several layers of perfectly normal surface epithelium, in which the protoplasm has stained light pink and the nuclei dark blue. In some of the cells lying farther inward, the protoplasm has stained a little darker on one side of the nucleus and assumed a granular appearance. The nucleus is not quite in the centre of the cell and on one side seems pressed in by the darker mass. In the following cells a still more marked degeneration of the protoplasm can be noticed. The cells are somewhat swollen; the central protoplasm is broken up into small round masses, while the peripheral protoplasm is normal. The nuclei are pushed still more to the periphery by the degenerative product; the nucleoli are clearly visible. Farther in, the cells are swollen considerably; the protoplasm has degenerated entirely and formed larger round masses. The nuclei are crescentic and pushed considerably to the periphery; the nucleoli can still be recognized distinctly. Scattered between the degenerated cells we find normal-looking nuclei and very fine eleidine granules, stained dark blue; these are the product of non-degenerating, but normally cornifying cells. In the adjoining cell-mass the nuclei appear only as dark stripes in the periphery of the cells and in the next layer they disappear entirely. Here we also notice a great number of cornified epithelial cells; the membrane of the degenerating cells begins to cornify also, and the protoplasm has formed large round lumps. In the following layers the cornified epithelial mass forms a honeycomb-like framework, stained dark blue, in which the totally degenerated cells, representing the molluscum corpuscles, are loosely suspended. The farther the cells have advanced in degeneration, the darker they have stained with eosine, until at last the finished molluscum corpuscles have assumed a dark-red color.

Although the contagiousness of molluscum contagiosum must be considered an undoubted fact, yet no one has ever succeeded in isolating the contagium with certainty. Neither has it been proven whether the tumor takes its origin directly from the surface epithelium, from a sebaceous gland,

or from a hair follicle. Virchow[1] and Thin[2] hold that the cellular hyperplasia begins in a hair follicle, Wedl and Bock,[3] as well as Kaposi,[4] allow the tumor to arise from a sebaceous gland, whereas Bizzozero and Manfredi,[5] Simon,[6] Neisser,[7] Caspary,[8] Kromayer,[9] and others allow it to originate from the surface epithelium. I am inclined to join the latter view, for in a number of sections I have observed, alongside of the tumor, a marked hyperplasia, especially of the lower epithelial layers, so as to make the papillæ appear incarcerated between the different epithelial invaginations. It made the impression upon me, as if the cells had grown down into the tissue and the papillæ later formed the above-mentioned connective-tissue pockets which in section appear as septa. Thus the connective-tissue capsule would have been produced by the resistance offered to the tissue by the growth, which would also account for the elevation of the tumor above the level of the normal skin.

Great diversity of opinion existed in regard to the nature of the contagium and the so-called molluscum corpuscles. Virchow (*l. c.*), Caspary (*l. c.*), Lesser,[10] and Kromayer (*l. c.*) consider the molluscum corpuscles vesicular formations, originating from a metamorphosis of the cell protoplasm. According to Bollinger[11] and Neisser (*l. c.*), molluscum contagiosum is produced by a monocellular zoöparasite.

Bollinger (*l. c.*) looks upon the molluscum corpuscles as gregarines; Neisser (*l. c.*) designates them as epithelial cells, filled with gregarines. Török and Tommasoli[12] think it probable that moll. contag. contains sporozoa, but don't look upon the molluscum corpuscles as parasites. Rieder[13] and

[1] Virchow, *Arch. f. pathol. Anatomie*, vol. xxxi., p. 144–154.
[2] Thin, The History of Moll. Contag., *Journ. of Anat. and Phys.*, vol. xvi. p. 202.
[3] Wedl and Bock, *Path. Anatomie des Auges.*
[4] Kaposi, *Vierteljahrschr. f. Derm. und Syph.*, 1877, p. 333.
[5] Bizzozero and Manfredi, *Vierteljahrschr. f. Derm. und Syph.*, 1871, p. 599.,
[6] Simon, O., *Verhdl. d. physiol. Gesellsch. zu Berlin*, 1876, No. 3.
[7] Neisser, O., *Vierteljahrschr. f. Derm. und Syph.*, vol. xv., iii., p. 553.
[8] Caspary, J., *Vierteljahrschr. f. Derm. und Syph.*, vol., ix., ii., p. 205.
[9] Kromayer, *Virchow's Arch. f. path. Anat.*, vol. cxxxii.
[10] Lesser, E., *Lehrb. d. Haut. u. Geschlechtskr.*, vol. i., p. 244, Leipsic, 1894.
[11] Bollinger, *Bericht d. 51, Versam. deutsch. Naturf. und Aerzte*, Cassel, p. 159.
[12] Török and Tommasoli, *Monatsh. f. prakt. Derm.*, 1893, No. 4.
[13] Rieder, *Münchener med. Wochenschr.*, 1893, p. 55.

Csokor (*l. c.*) hold that the tumor is of a parasitic nature. Csokor thinks that the molluscum corpuscles bear close resemblance to the parasite, described by Leuckhardt as coccidium oviforme.

My researches have given no satisfactory results in regard to the nature of the contagium producing the tumor. The view, however, that the molluscum corpuscles themselves are parasites, I consider decidedly erroneous, for in all my preparations I have been unable to detect the least proof which would favor such a possibility. The development of the molluscum corpuscles can be traced very accurately in Fig. 2. According to my opinion they are the product of a peculiar cell-degeneration, very likely due to the contagium, as it has been observed by Virchow, Caspary, Lesser, and Kromayer. In one respect, however, my observations differ from those of Kromayer. Kromayer claims that the degeneration of the cell begins first in the nucleus, which swells and forms a granular mass with the protoplasm. In all my preparations I was able to state (especially by counterstaining), as is also shown in Fig. 2, that the degeneration of the cell begins in the protoplasm, close to the nucleus, and progresses in the manner described above.

The result of our clinical and microscopical examinations would be as follows:

1. Molluscum contagiosum of the lid, or the margin of the lid, is not rarely the cause of conjunctival catarrh.

2. Molluscum contagiosum is undoubtedly contagious.

3. The molluscum corpuscles are to be considered the product of a peculiar degeneration of the epithelial cells, caused by the contagium.

4. The degeneration begins in the protoplasm of the cell itself and not in the nucleus of the cell.[1]

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[1] Before I had finished the translation of this article, Dr. A. Alt, whom I presented with several sections of the tumors, published[2] an article, in which he refers to the histological examination of several tumors, described by him in 1877[3] as xanthelasma tuberosum palpebræ. Dr. Alt is correct in stating that, as far as the histological appearance of our preparations is concerned, they are positively identical. Dr. Alt believes that the tumors take their origin from the sebaceous glands.

[2] Dr. Adolf Alt, "Xanthelasma Tuberosum or Molluscum Contag.," *Amer. Jour. of Ophth.*, vol. xiii., No. 11.

[3] Dr. A. Alt, "Xanthelasma Tuberosum Palpebræ," ARCH. OF OPHTH., vol. vii., p. 366.

Explanation of the Drawings.

Plates XVI. and XVII., Vol. XXXIII., Germ. Ed.

FIG. 1.—Section through molluscum contagiosum of the margin of the lid, vertical to surface of skin. Lobular structure, cell degeneration towards central aperture.—Obj. ii., Oc. iii.

FIG. 2.—Gradual transition from normal basal epithelium to molluscum corpuscles. Degeneration of protoplasm. Obj. vii., Oc. i.

I beg to express my gratitude to Prof. Uhthoff for the permission to publish the above case, and to Dr. Axenfeld for his suggestion to work it up, as well as for his assistance in the microscopic examination.

A COMBINED AGE AND REFRACTION SCALE.

By Dr. A. E. PRINCE, of Springfield, Ill.

(*With 2 drawings in the text.*)

I WISH to present to your readers a combined age and refraction scale, which has been made at my suggestion, and which is designed to enable the oculist and optician to ascertain the accommodation of one eye or both, with the greatest degree of precision and with the least possible loss of time, and furnish a direct comparison between the accommodation of the patient and the normal accommodation as established by Donders.

To accomplish this, a ruler (Fig. 1) is made fifty centimetres long, bearing in the centre an age scale parallel to which is a dioptric scale showing the corresponding accommodation for each year of life. This ruler is supplied with a slide (Fig. 2), carrying test type, the smallest corresponding to 0.25 Snellen, and which should be read distinctly by the normal eye at twenty-five centimetres or less.

The age being known, the first point to be ascertained is the punctum proximum expressed in dioptries. To ascertain this, the patient is required to accommodate for the nearest point at which he can see the finest print absolutely distinctly, when a glance will show whether the position of the punctum proximum is normal, or situated nearer or farther from the eye than the point indicated by the age of the individual as shown upon the age scale.

If nearer, it would indicate the presence of myopia, a low degree of myopic astigmatism; if farther, it would indicate the presence of hypermetropia, hypermetropic astigmatism

in a low degree, or the impairment of accommodation due to some pathological condition.

In the absence of any pathological lesion, the amount of error will be approximately indicated by the interval on the dioptric scale between the punctum proximum and the number corresponding to the age of the patient. This observation will often reveal latent hypermetropia in cases where it is not suspected, which will prove of value, especially in middle life, when the employment of a mydriatic is often undesirable.

To ascertain the punctum proximum, when the test type cannot be distinguished, observe the following:

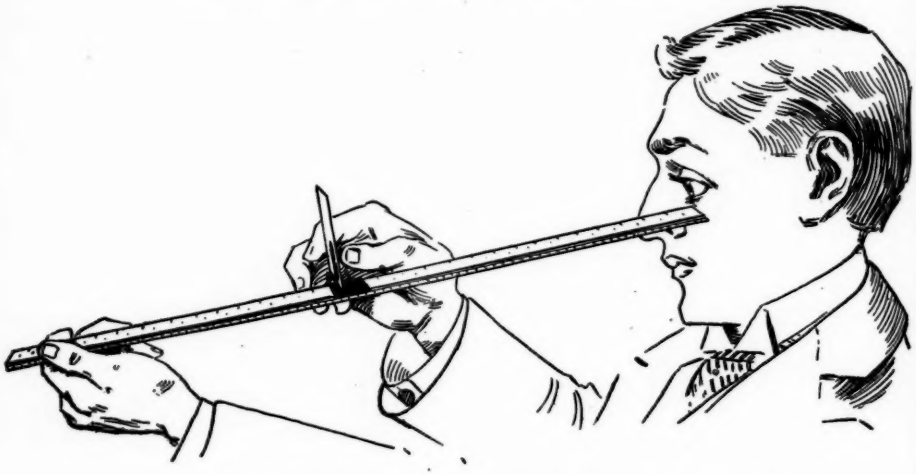
Employ a plus glass with which 0.25 Snellen type can be distinctly read, and subtract the strength of this glass from the number of dioptries corresponding to the artificial punctum proximum; when found the result will be the true punctum proximum, which will be a minus quantity, when the error is so great as to distort distinct vision.

This will occur in hypermetropia of high degree in young persons, and a correspondingly low degree in presbyopia. The amount of error will be found as before by subtracting the punctum proximum expressed in dioptries from the number on the dioptric scale corresponding to the age of the individual.

In case the type cannot be seen by the aid of a convex glass, impaired vision due to astigmatism or some form of amblyopia will be inferred, and must be diagnosed by appropriate means.

To ascertain the age of the individual, by means of the loss of accommodation, which progresses uniformly with advancing life, and is little affected by race, sex, or environment, it will first be necessary to determine the amplitude of accommodation.

To determine this in the emmetropic eye, it is only necessary to note the number on the dioptric scale corresponding to the punctum proximum. If hypermetropia or myopia be present, the amplitude of accommodation will be found by adding the former to, or subtracting the latter from, the number on the dioptric scale corresponding to the punctum proximum. The amplitude of accommodation being known (in the absence of any pathological condition), the approximate age of the individual will be found opposite the corresponding point on the age scale. Conversely, the dis-



covery of any impairment of the amplitude of accommodation would lead to the suspicion of pathological changes, and prompt a thorough intra-ocular examination.

Having determined the amplitude of accommodation, the reading glass required by the presbyope will be approximated by subtracting fifty per cent. of the amplitude of accommodation from the reading distance expressed in dioptries, and adding the error of refraction.

I have used one of these scales of my own construction for some time, and have found it very convenient. I also found that I measured the power of accommodation much more frequently than before having such a scale at hand,

and these tests resulted in some discoveries which might otherwise have been overlooked.

This led to the conviction that tests for the measurement of accommodation would be less likely to be neglected if such an instrument were in the possession of the profession, and accordingly I have requested F. A. Hardy & Co., of Chicago, to furnish a ruler having four scales, namely, a dioptric scale, an age scale, a millimetre scale, and an inch scale. This ruler is made of hard wood, and finished with a white enamel surface, and will be found a creditable addition to the armamentarium for the examination of refraction and accommodation.[1]

[1] To be obtained from F. A. Hardy & Co., 46 and 48 Madison Street, Chicago, Ill., for $1.25.

THE USE OF CICATRICIAL SKIN-FLAPS IN THE OPERATION FOR ECTROPION.

By HAROLD WILSON, M.D., Detroit, Mich.

DE WECKER says that "blepharoplasty is one of those operations in surgery in which more work has been done with the pen and pencil than with the bistoury." Its literature and its practical application are therefore disproportionate; yet it is evident, from the history of the operation, that, notwithstanding all that has been written and done, the conditions under which cicatricial ectropion arises, and the principles to be observed in its correction, have not always been clearly perceived by those who have essayed operations for its relief. In spite of the comparative rarity of the condition, and the infrequency with which the surgeon is called upon to render assistance, its importance is such that its intelligent discussion can hardly become too voluminous, if only a better understanding is thereby secured.

In a recent article upon this subject,[1] the statement occurs that "it is the general belief that scar tissue should not be included in skin-flaps." An examination of several recent text-books,[2] which may be taken fairly to represent commonly accepted opinions, confirms this statement, for, although in none of them is there to be found a direct declaration to that effect, the indirect and inferred opinion

[1] Hotz, "A Method of Utilizing Cicatricial Skin-Flaps in the Operation for Ectropion of the Upper Lid," Arch. of Ophth., vol. xxv., p. 293.

[2] Noyes, 1890; Norris and Oliver, 1893; Fuchs, 1892; De Schweinitz, 1892; Alt, 1893; Fick, 1896. Meyer, 1887, says: "The chances of success are all the greater the nearer the transplanted flap is to a cutaneous surface in all respects healthy and free from any inflammatory or cicatricial alteration."

is that cicatricial tissue is unfit for the formation of flaps. Now, that such a belief is often justified, is no doubt true, but that it is to be laid down as a general rule, is open to a serious debate.

One of the earliest attempts to relieve a cicatricial ectropion consisted in making a curved incision through the scar tissue of the lid, liberating and replacing the everted lid, and stuffing the wound with lint to keep it open, in the expectation that the lid would maintain its normal position after the wound healed. It was soon discovered that the effort was worse than useless, and the original deformity was likely to be increased.[1] The effort was then made to fill the defect left after liberating the lid, with pedicellate flaps of various kinds taken from the surrounding parts (Dzondi, 1815; Fricke, 1828; Jüngken, 1829; Dieffenbach, 1835, etc.), or from distant parts (Tagliacotius, sixteenth century), or with a non-pedicellate flap of skin (Le Fort, 1872; Wolfe, 1874), or with numerous small grafts of skin (Reverdin, 1869), dermo-epidermic grafts (Ollier), skin grafts in mosaic (De Wecker, 1872), or large thin epidermic grafts (Thiersch, 1874–1886), which brings the summary of methods down to the present time, omitting numerous minor modifications. None of these methods is without some value, and each has been successful in some cases.

In 1856, at a meeting of the Société de Chirurgie, regarding the question as to the use, in plastic operations, of pedicellate flaps taken from cicatricial tissue, the following conclusions were reached after a most thorough discussion:[2]

"1. When the cicatricial integument is thin, drawn, shining, very slightly vascular, entirely fibrous, adherent to the underlying bed, or separated from it by a very loose serous-like [succulent] tissue, it is not to be employed [in the construction of a flap].

"2. If, on the other hand, the cicatrix occupies only the superficial layers of a thick skin; if it is underlaid with a pannicle of fat, well nourished, of good vitality and without

[1] *Mackenzie on the Eye*, Am. ed., 1855, p. 244, "at the end of some months, matters are probably rather worse than they were before the operation."

[2] *Bull. Soc. de Chir.*, 1856, vol. vi., p. 549 *et seq.*

underlying adhesions, it may be used for the formation of flaps without hesitation.

"3. Even where the anatomical conditions are unfavorable we may use the cicatricial tissue, but only in a very limited way (*pour de très petits emprunts*).

"4. Cicatricial tissue may unite by first intention, either to other cicatricial tissue or to sound tissue.

"5. Cicatricial flaps are exempt from various inconveniences which accompany the use of flaps from healthy tissue. Thus, they lie flat, not riding up over the surrounding parts, and are not disposed, like the latter, to become puffy or softened in spots.

"6. If the face has been considerably disfigured by a large cicatrix, and if a portion of this surface is to be repaired, the lids, for example, it is advantageous, from a cosmetic point of view, to use cicatricial flaps. The employment of flaps of healthy tissue to make the new lid, leads to a disagreeable contrast with the surrounding parts, in some respects adding to the deformity already existing."

In the main these conclusions still remain valid; the experience gained since they were originally set forth, and the general progress which the art of surgery has made, have served rather to amplify and extend them, although the introduction of skin-grafting in 1869 rather turned the attention of surgeons away from the older methods. The adoption of antiseptic methods has rendered it easier to preserve the vitality of the transplanted flaps, and the preliminary treatment of scar tissue has made it possible to utilize much that formerly was considered unfit for use.

The changes which cicatricial tissue spontaneously undergoes were matters of very early observation. Mackenzie says[1]: "Contraction . . . gradually increases for some time after the process of cicatrization appears completed. . . . Matters then appear for a while to remain stationary, but in the course of years, the everted eyelid will have loosened itself a little from its unnatural situation. . . . In consequence of the mechanical motion to which the parts are subjected, a slight increase takes place in the

[1] Mackenzie, *loc. cit.*

flexibility of the cicatrized surface, and it becomes somewhat less firmly attached to the subjacent textures. The parts which were at first matted immovably together, give a little to the motions impressed upon them by external causes and the absorbents appear to contribute to this slight relaxation by removing some of the adventitious substance which bound down the integuments. This is all the réturn which is ever made to the natural state by the parts themselves." It was for the purpose of taking advantage of these natural changes in the character of scar tissue that Lawson laid down the following rule in the performance of blepharoplastic operations[1]: "Before attempting a plastic operation for the formation of a new eyelid, sufficient time should be allowed to lapse after the injury, for the skin in the neighborhood of the eye to have recovered as far as possible its healthy elasticity and softness. All thickening and induration of the subjacent cellular tissue should have passed away, and the skin should glide readily over the parts beneath it." In accordance with this principle, he relates a case in which fifteen months were allowed to elapse before an operation was undertaken.

In 1881, Bull,[2] proposed to bring about and increase the extent of these favorable changes in scar tissue by persistent massage. By this means "adhesions of scars, slight or extensive, to the subjacent parts have been slowly, cautiously, and painlessly detached, and a gradual absorption of the firm material in the dense parts of the scar has been brought about. . . . Depressed scars due to bone disease. . . . generally prove intractable to this method of treatment by massage." A case reported by Keyser illustrates the possibilities of this preliminary mechanical treatment.[3]

"The patient was severely burnt by an explosion of gas and oil. The face was a mass of cicatricial tissue; the skin of the forehead was thin, pale, parchment-like and as tight and immovable as a drum-head; the cheeks were hard, thickened, and

[1] Lawson, *Injuries of the Eye*, Am. ed., 1867, p. 372.
[2] Bull, "The Treatment of Scars of the Face Involving the Eyelids," *Am. Oph. Soc.*, 1881, p. 219; *Am. Jour. Med. Sci.*, 1881, n. s. vol. 82, p. 431.
[3] Keyser, "Blepharoplastics," *Wills Eye Hosp. Rep.*, vol. i., No. 1, 1895, p. 23.

incapable of movement under the fingers; there was a large ectropion of the upper and lower lids of both eyes. The method of Tagliacotius was tried and was unsuccessful. For fourteen months his face (all over, forehead and cheeks) was rubbed with neat's-foot oil, twice daily at first, then after some weeks three times a day; the skin being pressed and pushed and manipulated in all ways, to get up mobility. After the first three months a favorable change was noticed, and after fourteen months the skin on the forehead was as pliable as normal skin, and the cheeks could be pinched up and moved in any direction. . . . Transplantations [pedicellate] were then made from the forehead to make the upper lids and from the face alongside the nose for the lower, with brilliant success."

As showing the value of preliminary treatment, this is the most instructive case I have met with in the literature of this subject. In its original condition, the cicatricial tissue surrounding the eyelids was totally unfitted for plastic purposes, and in the correction of the ectropion there seemed to be no alternative but to resort to some of the methods of skin-grafting; yet by faithful and long-continued massage the structure of the cicatrices was so profoundly and favorably altered that their use in the formation of flaps to restore the lids became really the method of choice. The possibilities which lie in the systematic and persistent treatment of scar tissue preparatory to the performance of blepharoplastic operations are evidently worthy of a more careful practical consideration than has yet been given to them. Scar tissue presents varying characteristics. It may exist as a mere superficial alteration, with the body of the underlying skin but little altered; or it may be so extensive that the entire skin and subjacent soft structures have been converted into connective tissue with firm adhesions to the bony parts beneath. If its area is large, its vitality may be so precarious that comparatively slight alterations in the general health of the patient may cause its more or less extensive ulceration. The characteristic contraction of a scar may go on for years, and until it has been converted into an inelastic fibrous tissue. The contraction following burns is particularly marked, and is of course greater where the part

affected is lax and movable than where it is firm and rigid. The amount of deformity therefore, which will follow a scar upon or near the eyelids cannot be definitely determined until long after the original injury has healed. For the same reasons, the immediate effect of blepharoplastic operation may seem to be excellent, and yet the final result, after many months, may be almost a failure.

In a general way, we may say that all plastic operations for the relief of ectropion are made for two coincident purposes:

1. For the relief of deformity (Cosmetic).

2. To preserve or restore the integrity of the eyeball, or conjunctiva (Visual).

These two purposes always co-exist. Any degree of ectropion is a blemish to the face, and to a greater or less degree impairs the usefulness of the eye for vision. In some cases the visual, in others the cosmetic effect is the greater in importance, but in no case may either be disregarded. It is the inalienable right, if not the duty, of every human being to be as beautiful as the accidents of birth and the struggle for existence will permit, and although much beauty is unfortunately a rare endowment, it is the plain duty of the surgeon to spare or restore where possible, whatever beauty of form or face his patients may possess, and certainly he has no right ever to inflict an unnecessary disfigurement. Yet this fact is often disregarded, and perhaps nowhere more flagrantly than in the multitude of proposed operations upon the eyelids. In establishing, then, the principles upon which plastic operations for the relief of ectropion are to be performed, cosmetic considerations must have a permanent and important place. If the eyelids and the surrounding parts are composed of cicatricial tissue, the formation of a new eyelid from normal skin by the operation of Le Fort (Wolfe), however successful it may be from an anatomical standpoint, really adds in some degree to the patient's disfigurement, or at least, even though the lid is reposited, there remains a disfigurement due to the contrast of the graft with the neighboring parts in color and texture, so that if it is equally possible by another method to restore the lid

to its normal position and avoid this contrast at the same time, such a procedure is to be preferred, other things being equal. That is to say, under the circumstances specified, a cicatricial flap constitutes the method of choice. On the other hand, for similar reasons, given a cicatrix involving the lid only, either wholly or in part, the operation to be selected is its liberation or excision, and replacement by normal skin.

The conditions under which cicatricial ectropion exists, and the symptoms which each individual case presents are so various, that rules and methods for the performance of operations for its correction must necessarily be of the most general character. The factors which must be taken into consideration are in general the following:

A. Concerning the scar.

1. *Its Location and Size.*—The amount and portion of the lid involved will modify the method to be chosen. If the ectropion is due to the traction of a bridle of connective tissue, this may be divided. Small scars may be excised. The condition of the parts surrounding the lids must be considered. The direction in which the traction upon the lid is exercised must also be observed. The scar from the operative wound must be made, if possible, to assist in counteracting this traction. This may determine the position of the pedicle of the flap used.

2. *Its Character.*—As has been already indicated above, scar tissue is variable in its qualities, depending upon its cause, extent, location, and age. Some of it may be admirably adapted for transplantation, some may be admittedly unfit, and some which is unfit as it exists, may by proper mechanical treatment long continued, be converted into excellent material for flaps. Adherent scars due to disease of the underlying bone, may sometimes be divided subcutaneously, raised and supported upon hare-lip pins and subsequently treated by massage so as to make them eventually fit for plastic purposes.

B. Concerning the lid.

1. *The Elongation of the Lid Border.*—Where this elongation is slight it may be disregarded, but if it is considerable, the operation should involve its shortening.

2. *The Extent of the Eversion.*—An operation applicable to only slight degrees of eversion (*e. g.* the V Y operation), should not be attempted where the eversion is marked.

3. *The Amount of the Lid Structure Involved.*—It is of much importance to note whether the lid is involved in its entire thickness or whether the tarsal (posterior) layer is still normal.

C. Concerning the patient.

The *age and condition of the patient* are important. Skin-grafting by any method is much more likely to succeed in young than in old persons. Ill health of any sort, particularly disturbances of nutrition, may imperil the success of a plastic operation, so that where the other conditions are favorable, it may be necessary to resort to preliminary constitutional treatment. If the patient is mature, intelligent, willing, and docile, the Italian operation may be performed in appropriate cases, while if young or unruly, this method will be inadmissible.

D. Concerning the method of operation.

We may distinguish two general methods, which may be subdivided as follows:

I. Flaps with a pedicle.

a. From the surrounding parts.

b. From the arm. (Italian method.)

II. Flaps without a pedicle (grafts).

a. Grafts comprising the entire thickness of the skin.

1. Large grafts, fitted to, and completely filling the defect. (Le Fort—Wolfe.)

2. Smaller grafts, forming a mosaic, completely filling the defect. (De Wecker.)

3. Small, or medium-sized grafts, isolated to form separate centres of epidermization. (Reverdin, Lawson, Ollier.)

b. Grafts involving only the superficial portions of the skin.

1. Small flakes or scales of epidermis (Fiddes), or hairs with their root sheaths. (Schweninger.)

2. Large pieces, comprising the epidermis and outer layers of the cutis (Thiersch), or the epidermis and the tips of the papillæ (Eversbusch). (Practically in removing these large epidermic grafts, it is impossible to cut exactly in one plane,

so that they are of necessity thicker in some parts and thinner in others, rendering any real distinction between these two methods rather fanciful than otherwise.)

Each of these rather numerous methods has its sphere of usefulness. None is universal. For a decade or so, following the introduction of skin-grafting, it seemed as if the use of pedicellate flaps was destined to become obsolete, but the continued experience of operators has served somewhat to rehabilitate this ancient method. Its possibilities have been particularly increased by the introduction of the preliminary massage of scar tissue. It has been found that the method of Le Fort (Wolfe) may be followed by an immediate result that is capital and entirely satisfactory, and yet in the course of time, through degenerative changes in the flap, the accrued benefits may be quite lost. It has been observed that these grafts undergo great shrinkage; for example, one originally 2 *cm* square shrunk to 8 x 2 *mm* in size. They may submit to alterations in structure as well; the surface may exfoliate, granulations may spring up in the underlying parts, and the original cicatricial condition may be regenerated. The use of small grafts is tedious, and is followed by much contraction. The method of Thiersch is more promising. Healing is rapid and there is but little contraction. The new skin formed may have the thickness and quality of true skin. It is probably the best and most universal of all the methods of skin-grafting. It is true that the transplanted pedicellate flap may die; that it leaves a secondary defect, a new scar; that if a failure, it cannot be repeated, and that owing to the nature of the cicatrix, it is sometimes impracticable. It is also true that the secondary defects which skin-grafting leaves, if any at all, are remote and unimportant; that the operation may be repeated indefinitely, and that it is always possible. Yet the pedicellate flap may make a better lid, a more perfect and more comely restitution; the chances of a combined anatomical and cosmetic success may be greater, and the secondary deformity may not really exist as such. The arguments against it are not so coercive as they have seemed to be, and we are bound to concede to it a certain usefulness.

A summary of all the factors involved in the general problem, the relations of which we have been examining, seems to lead to the following propositions[1]:

The use of pedicellate flaps constitutes the method of choice.

1. When the cicatrix is confined to the lids, the surrounding parts being normal.

2. When the cicatrix involves not only the lids, but also the surrounding parts, and has the qualities necessary for successful transplantation.

3. When the cicatrix involves not only the lids, but also the surrounding parts, and although not of good quality for plastic purposes, can be rendered so by prolonged preliminary massage.

The use of skin-grafts (preferably those of Thiersch) constitutes the method of choice.

1. When the cicatrix involves not only the lids but also the surrounding parts, and neither has the necessary qualities for plastic purposes, nor can be made to assume them by treatment.

2. For the relief of secondary defects (either fresh or granulating), left after the performance of a plastic operation, or after the removal of malignant neoplasms.

It is a fair conclusion I believe, from what has been shown above, that "the general belief that scar tissue should not be included in skin-flaps" is an error, and that under many circumstances, it is the very material to be selected above all else for attaining the best results. Its employment requires experience, discrimination, and judgment. Its use is often improper, but it does not therefore deserve a sweeping and universal condemnation. Hotz[2] has shown how it may be put to excellent account from a mechanical standpoint, and the future experience of operators who do not consider it *déclassé* on general principles, and who are willing to avail themselves of its valuable properties, will, I think, demonstrate its usefulness, and will give it a legitimate and established place.

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[1] Modified from Valude, "De la restauration des paupières." *Arch. d'Oph.*, vol. ix., 1889, p. 398, *et seq.*

[2] Hotz, *loc. cit.*

TRAUMATIC ENOPHTHALMUS.

By C. ZIMMERMANN, M.D., Milwaukee, Wis.

ENOPHTHALMUS, *i. e.*, the sinking of the eyeball back into the orbit, is quite a rare affection, and its etiology is not yet sufficiently explained. Lately Beer (these ARCHIVES, 1893, xxii., p. 98), G. Cohn (*Klin. Monatsblaetter fuer Augenheilk.*, 1892, p. 337), Schapringer (*ib.*, 1893, p. 309), and G. E. de Schweinitz (*Trans. Am. Ophth. Soc.*, 1895, p. 386) have reported cases of their own and from the literature, all together about twenty-six. The cause of enophthalmus in most of these cases was atrophy of the retrobulbar tissue; in two, from a trophic neurotic disturbance. Beer thinks that "cicatricial contraction of the retrobulbar tissue, paralysis of the orbital muscle from a lesion of the sympathetic nerve, and fracture of the trochlea of the superior oblique are not rational explanations. From analogy we would suppose the atrophy of the orbital tissue to be due to a lesion of a nerve centre or tract, and particularly of the sympathetic or of the trigeminus. In neurotic atrophy of half of the face we have a picture similar to that seen in traumatic enophthalmus." De Schweinitz explains his case, in which there was no infraction of the orbital walls, by the lesion of the sympathetic.

I may add the following seven cases, five from recent literature, of which the titles of two are mentioned by De Schweinitz, and two of my own observation, making with the twenty-six above mentioned a total of thirty-one.

Sachs (*Beiträge zur Augenh.*, von Deutschmann, Heft 14, p. 44) observed a case of enophthalmus, which was caused by depression

of the inferior wall of the orbit. The orbit became larger, so that its contents with the eyeball sank deeper under the atmospheric pressure.

D. Marshall demonstrated cases of double enophthalmus in the Ophth. Society of the United Kingdom, July 5, 1895, but no description is given in the transactions (*British Medical Journal*, July 13, 1895).

Denig (*Archiv f. Aug.*, xxviii., p. 276, and *Jahresber. d. Ophth.*, 1894, p. 593) related a case in which he thinks that the fifth nerve itself (not its sympathetic fibres) caused atrophy of one side of the face and enophthalmus. Apparently there was a transverse fracture at both apices of the orbital pyramids, a fracture of the right petrous bone in the region of the tympanic cavity, and an alteration of the left fifth nerve (hemorrhage and pressure).

J. B. Roberts (these ARCHIVES, xxv., No. 3, p. 302) in a case of traumatic enophthalmus found depression of the orbit and the supra-orbital ridge and the orbital plate of the frontal bone fractured and driven into the membranes of the brain. There was ptosis, which did not seem to be due to the wound of the lid having damaged the levator muscle, but to nerve injury.

I have observed the following cases:

Case 1.—This is the same case, described in detail in my article "Laceration of the Optic Nerve and the Central Retinal Vessels; Retinitis Proliferans" (these ARCHIVES, vol. xxvi., p. 51), which presented marked enophthalmus. The enophthalmus was caused by a fall on the right eye, by which the visor of the patient's cap was detached and injured the lids and the eyeball, and caused paralysis of the superior rectus muscle.

Case 2.—Came under my care July 19, 1892. The right eye of a carpenter, while looking up on a new building, in which he worked, was struck by mortar falling down about 90 feet. I examined him soon after that and found a cast of mortar filling the conjunctival sac. The whole cornea was opaque and the conjunctiva discolored. Sloughing of the cornea and symblepharon necessitated enucleation in four weeks. In this case the enophthalmus was caused by the violent contusion of the eyeball and the contents of the orbit.

D. van Duyse and E. Bribosia published a case of enophthalmus with intermittent voluntary exophthalmus (*Archives d'opht.*, 1895,

p. 159), with the résumé, that enophthalmus may be due to post-traumatic tropho-neurotic affections, causing a gradual resorption of the fat cushion of the orbit.

If in the permanent cases of enophthalmus a paralysis of the trophic fibres is surmised, Schapringer is disposed to assume also a paralysis of Mueller's muscles, since the nervous fibres are closely connected at the point where the lesion is supposed to be. The theory attributing the cause of enophthalmus to paralysis of the sympathetic nerve has something enticing, especially if we consider the late experiments of Heese (*Archiv für die gesammte Physiologie*, vol. lii., p. 525) summed up in the following way: The different conditions of vascular tonus and the corresponding varying amount of blood in the orbit must influence the position of the ball. There are two forces governing the position of the ball; one is the state of contraction of the vessels with the consequent varying amount of blood in the orbit, and the other is the condition of the musculus orbitalis.

In order to learn how far the *sympathetic* nerve is involved, I put into the enophthalmic eye of our first patient cocaine, which stimulates the endings of the sympathetic nerve in the oculo-palpebral muscles. A protrusion of the eyeball, only occasionally seen after the instillation of cocaine, could not be detected, but the ptosis subsided completely, the palpebral fissure widened as far as that of the other eye, and the pupil dilated, indicating that the cervical sympathetic nerve was intact. Had it been paralyzed, no reaction would have occurred on instillation of cocaine, as *e. g.*, Pflueger did not see any effect of cocaine on the upper lid or the pupil in four cases of ptosis and myosis due to an affection of the cervical sympathetic nerve (*Cbl. f. Aug.*, 1885, p. 206). Thus we may fairly conclude, that the ptosis in our first case was only a mechanical consequence of enophthalmus. Although this experiment with cocaine does not prove the integrity of that branch of the sympathetic nerve which innervates the smooth muscular fibres of the musculus orbitalis of Mueller in the inferior orbital fissure (to the relaxation of which the recession of the eyeball is attributed), it makes it

very probable, as there is no sufficient reason why this more remote branch of the sympathetic nerve should be paralyzed and the others not. Therefore the explanation of traumatic enophthalmus without fracture of the orbital walls, based on the assumption of paralysis of the sympathetic nerve, becomes rather uncertain.

A CASE OF SPONTANEOUS ORBITAL AND INTRAOCULAR HEMORRHAGE OCCURRING IN THE COURSE OF A TYPHOID FEVER.

By Dr. C. E. FINLAY, of Havana, Cuba.

THE rarity of the following case, as well as certain unique features it presented, warrant, in my opinion, its publication.

On October 19th of last year, I was called in by Dr. Montané, of this city, to undertake the treatment of certain ocular complications which had made their appearance in a case of typhoid or typho-malaria which he was attending. The patient was a boy, son of well-to-do parents, ten years of age, who had previously enjoyed very good health, and in whose family there existed no taint; he was in the third week of his fever, his temperature running pretty high (between 39.5° and 40.5° C.), but the intestinal symptoms being little marked. Three days previously he had suddenly complained of a little itching in the left eye; a few minutes later an ecchymotic spot appeared on the bulbar conjunctiva. This soon spread over the whole eyeball, the eyelids began to swell, and at the end of a few hours both were enormously enlarged and œdematous, and through the palpebral fissure protruded the swollen and chemotic conjunctiva of the lower cul-de-sac. This condition of the left eye still persisted, when two days later the right eye suddenly commenced to swell in the same manner as the left had done, the swelling not reaching, however, the same extent. No ocular pain of any kind had been complained of. Coincident with the appearance of these phenomena was that of several subcutaneous ecchymotic spots all over the body and limbs, varying in size from that of a pea to that of a silver half-dollar. A hypodermic injection of caffeine,

which had had to be applied the day before, in the left arm, on account of the condition of the heart, had been followed by a subcutaneous hemorrhage, which extended from the shoulder to the elbow. The only other evidence of a hemorrhagic tendency was some bleeding from the nose and gums the day before the accident. The urine was normal. The child was being treated by cold baths and tonics, combined with intestinal antiseptics.

Present Condition.—The boy lay semi-comatose, in a typical typhoid state, with a temperature of 40.5° C. The left upper eyelid was enormously swollen and of a dark purple color; the lower, though also swollen and œdematous, was not as much so as the upper. Through the palpebral fissure protruded an enormously large and infiltrated fold of conjunctiva with numerous hemorrhagic spots, its surface being partially desiccated from exposure to the air. It was impossible to raise the upper lid enough to obtain any sort of view of the eyeball. There was no evidence of fluctuation or of pulsation. There was no spontaneous pain, and no tenderness on pressure. The right eye showed considerable swelling of the upper eyelid, marked chemosis, moderate exophthalmus, complete immobility of the eyeball; the cornea was clear, the pupil large and immovable; with the ophthalmoscope only a white grayish reflex could be obtained from the fundus; the eye was apparently sightless.

My diagnosis wavered between an orbital hemorrhage and a thrombosis of the cavernous sinus (for reasons see below). I proceeded to scarify, superficially but freely, the protruding conjunctiva of the left eye, and ordered iced boric acid compresses to be kept applied over both eyes day and night.

On October 20th—the next day—the general symptoms showed a marked improvement, a marked fall in the temperature having taken place, and the child being almost entirely conscious. The swelling of the left lids had diminished a trifle, but at the site of the scarification the protruding conjunctiva showed three large dark blebs, which on being punctured let out dark liquid blood. The right eye showed more swelling of the lids, the cornea was hazy, and the anterior chamber filled by a plastic exudate. The aspect was that of a purulent choroiditis.

October 21st.—Left eye: Considerable diminution in the swelling of the upper lid. From behind and above the protruding conjunctiva some large dark blood-clots were to be seen presenting. Right eye: The cornea appeared on the verge of

sloughing. That afternoon, at my request, Dr. Montané and I held a consultation with Dr. Montalvo. At this meeting I was able, for the first time, to raise the left upper eyelid with a Desmarres elevator. The large clotty masses perceived in the morning were found to proceed from the interior of the eye, making their way through the site of the sloughed cornea. The right cornea had commenced to slough. Dr. Montalvo concurred in my diagnosis of "Orbital and Intraocular Hemorrhage (R) and Metastatic Purulent Choroiditis (L)." No variation was made in the treatment.

October 22d.—Cornea of the right eye had totally sloughed. Instead of suppurating, the vitreous was of normal consistence and bright red in color.

From this time on the general symptoms continued to improve, and the local swelling gradually diminished, due to the absorption of the intra-orbital extravasations and elimination of the protruding blood clots, till on November 4th the orbital contents were normal, with the exception of the eyeballs, which were shrunken and sightless. The right eye, after the disappearance of the chemosis, showed for several days a hemorrhagic extravasation on the surface of the sclerotic. At no time was there any spontaneous pain, and only at the end was a little discomfort complained of during the dressings. After the first few days permanganate of potash and bichloride of mercury solutions were used in washing out the eyes to prevent any secondary infection of the blood-clots. The fever continued till about the middle of November. The boy is now fairly convalescent.

This fortunately rare accident is scarcely mentioned in the text-books of ophthalmology and not at all in those of general medicine or internal pathology, nor even in the two most modern monographs dealing with the relations of general diseases to those of the eye.[1] Of the twenty-six cases of spontaneous orbital hemorrhages which I have been able to collect in literature, not one occurred in typhoid fever. The only mention of the possibility of such a complication which I have come across is in a paper by Carron du

[1] Berger, *Les Maladies des Yeux dans leurs Rapports avec la Pathologie Générale*, Paris, 1892.
Knies, *Beziehungen des Schorgans und seiner Erkrankungen*, Wiesbaden, 1893.

Villards written in the year 1858,[1] in which in dealing with non-traumatic bloody effusions into the orbit he refers to a report of his father to the King of Sardinia in the year 1827, where several cases are mentioned. Berlin[2] seems however to doubt their authenticity. In none of these twenty-six cases was there any sloughing of the cornea, nor an intraocular hemorrhage of the nature of that which occurred in the left eye, which reminds one of the severe choroidal hemorrhages seen, at times, after glaucoma and cataract operations.

The diagnosis was at first by no means easy and had to be arrived at by a process of exclusion. Of the different lesions capable of bringing about a similar local appearance, an arterio-venous aneurism of the cavernous sinus could be excluded off-hand, in view of the absence of pulsation or thrill, of the rapid development, and of the lack of any history of traumatism or of any local lesion which could explain its appearance. An orbital abscess, cellulitis, or phlebitis could likewise be discarded, on account of the rapid development of the lesion, and the absence of fluctuation, spontaneous pain, or local inflammatory symptoms. A thrombosis of the cavernous sinus was more difficult to exclude, none of the above reasons sufficing. The mental condition of the patient complicated matters, it being no easy task to determine whether the semi-comatose condition in which he lay was to be laid at the door of his typhoid or attributed to the local lesion. The double-sided nature of this, the fact of venous thrombosis from weakening of the heart action being known as one of the complications of typhoid,[3] inclined me towards a thrombosis. On the other hand, the ecchymotic spots on the lids, the absence of any œdema over the mastoid, mentioned by Fuchs[4] as being of diagnostic importance in the differentiation of a thrombosis from an orbital phlegmon, and especially the multiple subcutaneous hemorrhages all over the body showing a generalized hemorrhagic tendency, were in favor of the

[1] *Ann. d'Ocul.*, xl., 124.
[2] Graefe-Saemisch, *Handb. d. gesammt. Augenheilk.*, vi., 559.
[3] Strumpell, *Pathologie Interme*, i., 23. French translation, Paris, 1884.
[4] *Lehrb. d. Augenh.*, Leipzig, 1891, S. 640.

diagnosis of orbital hemorrhage. The marked diminution of the cerebral symptoms the second day, notwithstanding the persistence of the local lesion, confirmed this last opinion, which was still further upheld by the subsequent course of the affection as well as by the favorable termination of the disease as regards life.

A careful analysis of the reported cases fails to reveal any common cause: in six scurvy was the alleged one, but in all these this is not quite clear; in four there was Bright's disease, in two the occurrence was attributed to a sudden suppression of the menses, in one there was purpura, in one hæmophilia, in one anæmia, in one arterio-sclerosis, and in one the lesion was attributed to a reflex irritation from the stomach. In my case it seems to have been some degenerative change in the walls of the blood-vessels,[1] in connection with the general lowering of the system belonging to the typhoid; or else we had to deal with a complicating purpura[2]. The sloughing of the corneæ was evidently due to interference with their nutrition by the mechanical pressure of the blood-clots and effused serum. The intraocular hemorrhage of the left eye probably occurred on the sudden diminution of the intraocular pressure coincident with the corneal sloughing. As already stated it was of the same nature as those disastrous post-operative choroidal hemorrhages which occur, fortunately most rarely, after cataract extractions and somewhat less infrequently after glaucoma operations.

The *treatment* employed only tended to favor the absorption of the effused blood and elimination of the protruding blood-clots, special care being taken to prevent any secondary infection, little or no hope ever having been entertained of saving either eye. The general treatment was directed to toning up the system, lowering the temperature (cold baths), disinfecting the intestinal tract, and preventing a recurrence of the hemorrhages (ergot).[3]

[1] Homolle, Jaccond's *Dictionnaire de Médecine et Chirurgie*, vol. xxxvi., p. 595.

[2] This is rather rare; thus Liebermeister only found it nine times in 1420 cases (Homolle, *l. c.*, p. 723).

[3] In only ten of the reported cases of spontaneous orbital hemorrhage could I find any mention of the termination—four were total recoveries, one a partial recovery, and five total losses of sight or life.

LIST OF THE CASES OF SPONTANEOUS ORBITAL HEMORRHAGES REPORTED IN LITERATURE.

1. FISCHER, *Lehrb. d. gesammt. Entzund.*, Prague, 1846, S. 359. (Quoted by Berlin, *l. c.*)

2. (?) HYRTL, *Topograph. Anat.*, i., 159, 1853. (Quoted by Berlin, *l. c.*)

3. (?) v. GRAEFE, *Arch. f. Ophthal.*, i., 1, 424. (Quoted by Berlin, *l. c.*)

4. CARRON DU VILLARDS, *Ann. d'Ocul.*, xl., 124.

5. WHARTON JONES, *Brit Med. Jour.*, May, 1863. (Quoted by Berlin, *l. c.*)

6. ZEHENDER, *Handb. d. Augenh.*, ii., 414, 1876. (Quoted by Berlin, *l. c.*)

7. MAGNUS, *Deutsche med. Wochenschr.*, 1878, p. 29. (Quoted by Friedenwald and Crawford, *vide infra.*)

8. 9. AYRES, these ARCHIVES, x., 1, 42.

10, 11, 12. SATTLER, these ARCHIVES, xiv., 2, 190.

13. MOTAIS, *Ann. d'Ocul.*, xcv., 4.

14. THOMPSON, *Jour. Am. Med. Assoc.*, Oct. 30, 1886. (These ARCHIVES, xvi., 3, 341.)

15. PANAS, *Arch. d'Ophthal.*, viii., 2, 153.

16. (?) DAY, *Med. News*, 1888, p. 460. (Quoted by Friedenwald and Crawford, *vide infra.*)

17. PRIESTLEY-SMITH, *Ophthal. Hosp. Rep.*, xii., 270. (These ARCHIVES, xviii., 3, 339.)

18. JEAFFERSON, *Lancet*, 1889, ii., 111. (Quoted by Friedenwald and Crawford, *vide infra.*)

19. (?) DE WECKER, *Traité Complet d'Ophthal.*, par de Wecker et Landolt, iv., 749. Paris, 1889.

20, 21, 22. SPICER, *Trans. Ophthal. Soc. of U. Kingdom*, xii., 33. (These ARCHIVES, xxii.)

23. MITVALSKY, *Hirschberg's Centralblatt.*, 1893, 1. (Quoted by Friedenwald and Crawford, *vide infra.*)

24. RAILLON, *Lancet*, March 3, 1894. (Quoted by Friedenwald and Crawford, *vide infra.*)

25. FRIEDENWALD and CRAWFORD, these ARCHIVES, xxiii., 1, 142.

26. (?) GUNN, Ophthal. Soc. of U. Kingd., May 7, 1896. (*Ann. d'Ocul.*, cxv., 469.)

TRAUMATIC PULSATING EXOPHTHALMUS—LIGATION OF COMMON CAROTID—RECOVERY.

By A. B. KIBBE, M.D., Seattle, Wash.

TRAUMATIC pulsating exophthalmus is not so rare as to make a simple case-history of very great value. For statistical purposes, however, every case treated, and whatever the result, should find its way into medical literature.

The following instance presents an added point of interest through the unusually complete combination of the symptoms of *cavernous sinus thrombosis:*

H. C., aged twenty-four, was injured May 10, 1896, by having his head caught between two heavy logs. It was thought at the time that his injuries were almost necessarily fatal, owing to the colossal hemorrhage from nose and mouth and from the right ear. He was removed to his home as soon as possible, where examination showed no external wound. Both eyes were in a state of marked exophthalmus and unconsciousness was profound.

On the day following the injury, his attending physician, Dr. Beach, observed the following conditions: Œdema of brow and lids and complete paralysis and anæsthesia of right side of face. Pupils dilated and immovable. Immobility of right eye. Pronounced chemosis of conjunctiva in both eyes, more intense in right. Deafness in right ear. Paralysis of velum; as shown by regurgitation of fluids through nose when attempts were made to swallow.

His general condition slowly improved until September 11th, when he consulted me in company with Dr. Wells of Shelton, who was then attending him. Examination at this time showed

paralysis of right facial, anæsthesia of corresponding side of face; complete right ophthalmoplegia interna and externa ; chemosis of conjunctiva protruding between lids, but confined to lower half of globe. Inferior two-thirds of cornea covered by chemosis, which, aided by exposure consequent on the drooping of the lower lid, had apparently caused an erosion of the corneal epithelium and superficial layers of the corneal tissue. V = fingers at two feet. Slight pressure on the globe elicited marked pulsation. The finger-tip introduced beneath upper and inner edge of the orbit disclosed dilated and strongly pulsating vessels. Auscultation over the temporal and frontal regions revealed a loud aneurismal bruit, more distinct in the former locality. The left eye showed an extensive cicatrix, involving quite the lower half of the cornea ; pupil dilated and fixed. V = $\frac{20}{80}$. Motion perfect in all directions. The paralysis of the velum had disappeared. Hearing distance, whispered speech at thirty centimetres. Tuning-fork heard better on mastoid than in front of ear. No exact tests were made of the hearing further than this, owing to the weakness of the patient. Ligation of the common carotid having been proposed and consented to by the patient, he was sent to the Seattle General Hospital the same day ; and eleven days later, assisted by Dr. A. Raymond, I tied the artery just above the omo-hyoid muscle. Pulsation and bruit ceased at once. The chemosis gradually diminished, and the pain ceased almost entirely. The protrusion of the globe gradually grew less, but no improvement in motility was apparent. Sensation seemed to be returning, and he thought his hearing in the affected ear was slightly improved. The watch and whispered speech, however, failed to show any marked change. The condition of the cornea rapidly improved, but vision remained as before. He was discharged from the hospital twelve days after the operation, and returned to his home.

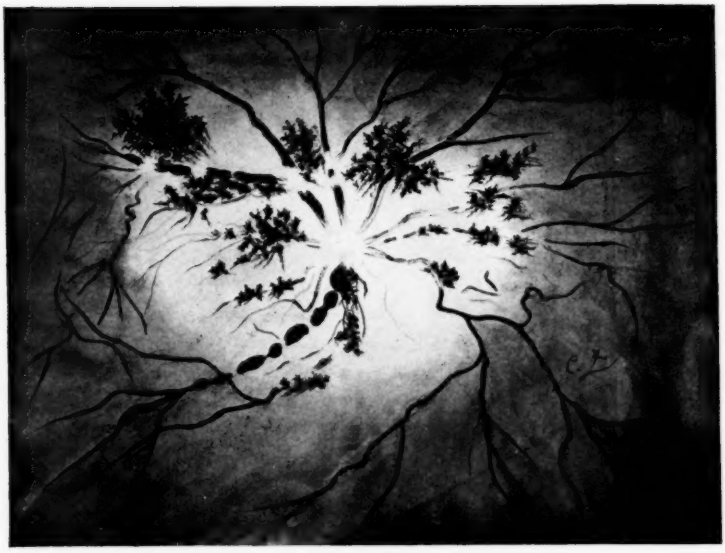
A letter received from his physician, Dr. Wells, November 4th, states that his condition is very much better. There has been no return of the aneurismal bruit, and the exophthalmus is less pronounced. The facial muscles have regained some power, and the eye can be almost completely closed.

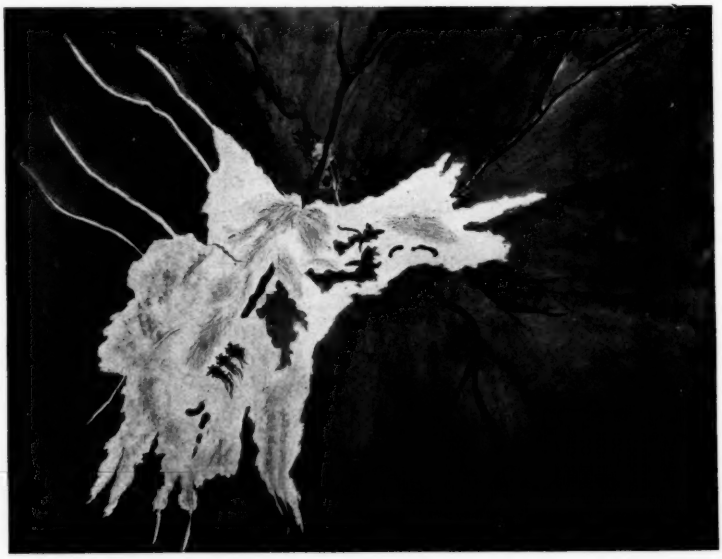
It is rare to see so complete a combination of the symptoms of cavernous sinus thrombosis. Scarcely one was lacking. Œdema of brow and lids, exophthalmus, chemosis, complete ophthalmoplegia externa, with facial paralysis and

anæsthesia, make the clinical picture complete. Whether ligation of the carotid performed earlier would have prevented the extensive injury to the right cornea consequent on erosion and pressure from the chemosis, is questionable. The hemorrhage into the orbits must have been excessive, as shown by the condition of the left eye, which presented a large corneal cicatrix, but no further evidence of involvement of its respective cavernous sinus. To be sure the latter may have been thrombosed and later have become pervious.

A complete case-history up to the time I saw the patient was not obtainable, as Dr. Beach, who attended him at the time of injury and for several weeks thereafter, was not with him when he consulted me.

While the symptoms of sinus thrombosis were positive, it is not probable that there was an actual thrombus in the vessel. That which produced the symptoms was unquestionably the rupture of the internal carotid artery into the sinus, permitting access of arterial blood to the venous paths and consequent increase of pressure on the nerve trunks.





LACERATION OF THE OPTIC NERVE AND THE CENTRAL RETINAL BLOOD-VESSELS; RETINITIS PROLIFERANS.[1]

By C. ZIMMERMANN, M.D., Milwaukee, Wis.

(*With two figures.*)

THE few cases of laceration of the optic nerve and the central retinal vessels so far published have been studied in connection with the experiments of Berlin, Leber, and others on animals. These, however, had led to different results, so that the clinical pictures were not always in harmony. Therefore Wagenmann (*v. Græfe's Archiv*, vol. xxxvi., iv., p. 1) again took up the experiments on rabbits, and showed that in some of the former the retinal vessels had not been divided, as supposed by the authors, and that some of the subsequent ophthalmoscopic changes were due to a division of the *ciliary*, not the retinal vessels. In order to verify, whether the ciliary or the retinal vessels or both were divided, he used a new method, viz.: he made injections from the common carotid artery, a method which alone can yield reliable results.

The various features of the following case will be better understood, if we compare them with the experimental and anatomical investigations of Wagenmann, for which they will furnish a clinical commentary. We must, however, bear in mind, that observations made on animals are not always strictly applicable to the human body on account of anatomical differences. Some animals have no retinal vascular system at all, and in the rabbit the retina contains

[1] Read before the Milwaukee Medical Society, December 8, 1896.

blood-vessels only so far as the medullated nerve fibres extend.

I saw the case for the first time on Dec. 21, 1895, in consultation with two physicians.

History.—On Dec. 18, 1895, the patient, a tall, strong man of thirty-seven years, attempted to board the front platform of an electric car, which was moving fast. He fell, however, and dropped with the right side of his face on the ground with such violence that the strong leather visor of his cap was detached and struck his nose and right eye. He did not lose consciousness and was able to walk up stairs to a physician's office nearby. A horizontal wound, 3 *cm* long, extended over the right upper lid and one vertically upwards along the lateral margin of the orbit 1.5 *cm* long. Another vertical wound was at the medial angle of the palpebral fissure, 1 *cm* long. The nasal bones were fractured. Considerable bleeding. The wounds were sutured and the nose dressed.

Dec. 21st I found the following *condition:* Lids of right eye swollen, no exophthalmus. A vertical wound of the ocular conjunctiva at the lateral portion. The conjunctiva, very red and swollen, projected, in the form of a blister, between the lids, even when they were closed. *Ptosis* of upper lid and lack of mobility of the globe outward, downward, and upward. Some scratches on the cornea. Pupil irregular, wider than the left, not reacting to light directly, but slightly consensually. T. not diminished.

Ophthalmoscopically : Media clear. The optic disc is not clearly defined ; its situation, however, can be inferred from the arrangement of some radiating vessels. The background around it has a milky appearance as in embolism of the central retinal artery. Most blood-vessels are lacking, some are linked. Retinal hemorrhages. $V = 0$, not even perception of light in any portion of the visual field.

Diagnosis.—Laceration of the optic nerve and the central retinal vessels between entrance of the latter into the optic nerve and the eyeball.

Prognosis.—Absolutely bad in regard to sight.

Dec. 30th (at my office).—Optic disc not defined, shows no red blood-vessels, the contours of which can, however, be made out. In some there is a thread of blood in their axis. The vessels

which are visible are mostly veins, which are thickened and severed into dark red sections like sausages. Retinal hemorrhages along the veins. The periphery of the fundus has a normal redness, but the milky haziness around the disc is the same (Fig. 1).

Jan. 22, 1896.—Some blood-vessels at optic disc are transformed into empty cords, except four, which contain a filiform red blood column. Two large veins, running downward and laterally, are interrupted and end temporally into white cords. The hemorrhages are partly absorbed, the milky appearance is subsiding. Formation of connective tissue commences.

Feb. 11*th.*—Right pupil 4.5 *mm*, left 3 *mm*. Both move on convergence and accommodation. Right reacts to light only consensually, not directly. Left only directly, not consensually. The ocular movements are normal except upwards, from paralysis of the superior rectus muscle. The ptosis persists. The skin of right upper lid below the supraorbital margin presents a deep furrow. Right eyeball is sunk back into the orbit, and the eye looks smaller, gives the impression of an artificial eye. It shows marked *enophthalmus*.

March 11*th.*—Hemorrhages mostly absorbed, but white patches are now visible which look like new formation of connective tissue.

Sciascopy shows the same accommodation in right as in left eye at a convergence to a point of fixation at 25 *cm* (*cf.* my article "Accommodation in the Amaurotic Eye," these ARCHIVES, vol. xxv., p. 43).

Oct. 3*d.*—Right pupil dilates after instillation of homatropine, except the lower portion. Tension diminished. Glaring white connective tissue starts from the optic disc toward the nasal portion of retina. It has an alveolar arrangement, leaving red fundus between its meshes. Some blood-vessels pass over it, some are hidden and emerge from its peripheral borders, some are very small and are apparently new-formed. Only a few small spots of black pigment are seen at its upper border. Blood-vessels at the papilla empty, in some a very thin axial red line, one runs upwards, one downwards and two downwards toward the temple. Very fine new-formed blood-vessels in the shape of a fascicle course from the periphery of the optic disc a short way in a temporal direction, and form a fine net-work toward the macula. At the latter there is also new-formed whitish tissue and two hemorrhagic patches. The optic disc is partly covered by

connective tissue, but what can be seen of it is white, atrophic. All these details are best seen with + 2.00D. The lower temporal portion of the fundus presents an extensive formation of connective tissue. It is prominent (best seen with + 6.00D), has a greyish appearance and reminds one in its shades of the pictures of mountains on a map. The lower vessels lead toward it and disappear. At its periphery white cords (former blood-vessels) spread toward the periphery of the fundus which has the usual red color.

Nov. 7th.—(Fig. 2.)—The degeneration and formation of connective tissue has further developed. The optic disc is covered by it and by more new-formed blood-vessels. There are only two retinal vessels, one upward with varicose course and one downward, which contain blood, commencing some distance from the disc. Some new-formed blood-vessels are seen on the connective tissue tracts and some remnants of hemorrhages. Next to the upper vessel the degenerated wall of another blood-vessel can be clearly seen. It has dark nodules as appendices, apparently remnants of varicosities. More towards the equator it contains blood.

The clinical history and the ophthalmoscopic picture show, I think, evidently that the diagnosis laceration of the central retinal vessels behind the globe was correct. The question arose, however, whether the central vessels were injured in the orbit *before* or *after* their entrance into the optic nerve, which occurs 15 to 20 *mm* behind the eyeball. In the latter case we would also expect a laceration or an avulsion of the portion of the optic nerve containing the central vessels, which so far only has been observed, when foreign bodies entered the orbit with great force (Pagenstecher, *v. Graefe's Archiv*, xv., 1., p. 223, Schiephake, *Inaug. Diss. Giessen*, 1888), or if the optic nerve was purposely cut, as in a case of carcinoma of the optic nerve removed with preservation of the eyeball by Knapp (These ARCHIVES, vol. iv., p. 323). Ophthalmoscopically it is of no importance, as injuries of the optic nerve without damage to the central vessels do not show until two to four weeks afterwards, when atrophy sets in (Leber in Graefe-Saemisch, v., p. 919). Nor would it make any difference to sight, which

is lost in either case, and the final result in atrophy, as division of the optic nerve behind the entrance of the central artery causes atrophy of the nervous elements as well as embolism of the central artery (which has the same effect as cutting the artery), with preservation of the continuity of the optic nerve.

The wounds of the skin and the paralysis of the rectus superior indicate that the visor struck the upper lid and gouged the eye-ball from above by which the optic nerve very likely was ruptured. In favor of laceration of the nerve is the reflex insensibility of the pupil, showing that the pupillary fibres of the optic nerve were paralysed, which are more resistant than the visual fibres, and may remain intact in blindness from peripheral affections of the optic nerve and retina, as *e. g.* from mere interruption of the retinal circulation. The laceration of the *central artery and vein* which run together only within the optic nerve, also speak for a lesion of that portion of the nerve. There was no exophthalmus after the accident from any considerable orbital hemorrhage, which would have happened, if the blood-vessels were injured further back, because then most likely more blood-vessels than the central vessels alone would have been ruptured. We had, to a certain degree, a combination of the ophthalmoscopic picture of embolism of the central artery and thrombosis of the central vein, only modified by one another.

When the injury occurred, the blood supply of the artery was suddenly cut off, and the blood flowed out from the opened extraocular retinal vessels (arteries and veins), which therefore were empty on the disc and a little way in the retina, where they ended, gradually tapering away. Arteries and veins could hardly be discriminated, but they seemed to be mostly veins. The circulation had ceased entirely.

Wagenmann examined, with the ophthalmoscope, his rabbits a few minutes after division of the optic nerve and the central retinal vessels, and saw the disc become pale and white, the vessels narrowing by the blood current being cut off, the papillary portion emptying its blood outside, and the following interruption of the blood current in several

portions. When he divided the central vessels by the galvano- or thermo-cautery (p. 79), the vessels on the disc contained decidedly more blood, and the current did not spread as readily into several portions, because the eschar obviated an effusion of blood into the orbit.

Milky Opacity of the Fundus.—Similar to *embolism* of the central artery was, in our case, a uniformly white, milky haziness of the retina, the indistinctness of the optic disc, and the partial and irregular appearance of blood-vessels. Leber attributes this extensive white cloudiness of the retina in embolism to finely granular opacity in the nervous and elementary parts, and the presence of granular fat cells in the retina. As the opacity generally subsides in a relatively short time, Wagenmann thinks that it cannot be due to essential and anatomical changes in the retina. If it were caused by degeneration of the nerve fibres it could not very well disappear, as it does, before the degeneration is established. Wagenmann, therefore, surmises, that it is produced by transient œdema of the nerve fibres in the retina from the disturbance of circulation, and perhaps is dependent on the integrity of the veins which is preserved in embolism. So far, he says, we are not able to determine beyond doubt whether laceration of the central artery and vein in man occasions the same opacity as embolism (p. 119). Our case answers this question in the affirmative as well as Knapp's case, which, however, was complicated by previous papillitis.

Wagenmann (p. 70) considers the opacity obtained in his experiments after division of the optic nerve and *ciliary* vessels due to the cutting of the latter, since it never occurred in simple division of the optic nerve and the central retinal vessels, and, therefore, different from the cloudiness in embolism of the central retinal artery. This I would explain by the anatomical variety and the different part which the retinal vessels play in the nutrition of the retina of man and rabbit, where they reach only as far as the medullary fibres extend.

Condition of the Retinal Vessels.—Under normal conditions the intraocular pressure must be equal to the intravascular

pressure at the end of the retinal vein. "Were it greater, it would compress the end of the vein and stow the blood at the periphery. Were it less, then the vein would swell as much as the elasticity of its walls admits" (Knapp, *l. c.*, p. 347). In our case, the intravascular pressure in the central retinal vessels was abolished, since the central artery was torn, and thus the *vis a tergo* wanting. Therefore, the end of the central vein was completely compressed by the intraocular pressure, and the further outflow of blood from the retinal vein was stopped. The blood which, by the last systole before the injury occurred, had been propelled into the retinal arteries and then through the contractility of the arterial walls into the capillaries and veins, stagnated now in the veins and distended them in some places. The blood column (in the veins) grew irregular and was interrupted, since there was no continuous flow any more, and the color turned dark from want of oxydation through arterial supply. Blood-vessels shut off from circulation degenerate. Their walls became permeable, so that, when, after a few days, a collateral blood-supply developed from the only communication of the retinal arteries, the circulus arteriosus Zinni (of the posterior ciliary vessels) encircling the entrance of the optic nerve into the eyeball, hemorrhages occurred *per diapedesin.*

Thus we had a similar ophthalmoscopic picture to *thrombosis of the central retinal vein* in addition to that of *embolism of the central artery*, and, therefore (from the very scanty arterial blood-supply), not so extensive. It shows that the anastomoses by which the venous blood could leave the retina (after some collateral arterial supply had been established) were inadequate.

And this is another proof of the laceration of the vein in the optic nerve. If the central vein had been injured in its course *extra opticum*, the numerous collateral veins would have furnished a sufficient outlet of the blood contained in the central vein after the re-establishment of the collateral retinal circulation, and then we would not have had the ophthalmoscopic picture of thrombosis. Mitvalsky (*Archives d'ophth.*, 1896, p. 22) considers this point of the greatest importance in regard to the loss of vision in obturating

thrombosis of the central vein, which only occurs, when the *vein in the optic* nerve is thrombosed, not in its course outside the nerve. According to Knapp (*l. c.*, p. 348), "the way by which the venous blood could leave the retina (after the main outlet of the venous blood was closed, in his case, by the division of the optic nerve) was the venous and capillary anastomoses between the optic papilla and the adjacent retina on the one hand, and the free edge of the choroid on the other, and thence it went through the vasa vorticosa at the equator of the globe out of the eye. This seems a long and circuitous road, offering great resistance to the current. The course of the disease also showed that these anastomoses were inadequate. The veins dilated more and more, became varicose, finally burst in many places and occasioned profuse retinal hemorrhage." Thus *hemorrhagic infarctus* in the retina occurred also in our case, due to the combined action of venous congestion and the abnormal permeability of the walls of the capillaries and veins, brought about by arterial ischæmia. (Cohnheim, *Vorles. ueb. allg. Path.*, 1, p. 88.)

Wagenmann likewise observed (p. 72) that the residual blood in the veins changes around, so that it appears in fusiform accumulations at different times in different portions of the vessels, that the same portion appears filled at times, at others empty. He thinks this partly to be due to the collateral afflux of blood. Different from Knapp's and our case were in Wagemann's experiments the very few and small retinal hemorrhages.

Re-establishment of Circulation.—In most of his animals an imperfect circulation was established through the capillary anastomoses at the periphery of the disc; even the artery on the disc was refilled. Later on he found several fine, new-formed blood-vessels at the disc coming from outside to which he is inclined to attribute the restitution of circulation. Vertical and frontal serial sections of the entrance of the optic nerve indicated that the *restitution of circulation is chiefly owing to new-formed vessels* which enter the disc partly from the choroidal opening, partly from the optic sheath and the episcleral tissue, *i. e.* from the

ciliary vessels, and communicate with the (former) retinal vessels. The veins are larger and more numerous than the arteries, but, in comparison to the previous retinal circulation, they are permanently narrowed, less numerous, and do not spread as far into the retina. In some of his experiments the circulation was not re-established. The vessels were empty or they contained amorphous albumen, leucocytes, and now and then degenerated red blood corpuscles. Later on he found them obliterated, so that they could not be injected (pp. 84 and 85).

The collateral blood-supply in our case was very scanty, since only few retinal veins showed varicose portions and a few vessels contained a very small amount of blood. Most of them were transformed into empty cords. At the optic disc itself they were not refilled, some only exhibited an axial red line. New-formed blood-vessels could also be observed on the disc and in the retina.

Degeneration of the Retina and Retinitis Proliferans.—The further course of the morbid changes was degeneration of the retina with development of connective tissue covering the disc and a great portion of the retina. The blood-vessels were partly hidden by it, partly branched over it. The extensive tracts of white and gray fibrous tissue, which on some places projected + 6.00 D., reminded one very much of the affection described by Manz as *retinitis proliferans* (*von Graefe's Arch.*, xxii., iii., p. 229 and xxvi., ii., p. 55). Manz examined the case anatomically and found a chronic retinitis with new formation of tissue on the inner surface of the retina, and therefore called the disease retinitis proliferans, since he regarded the inflammation of the retina as the primary change. Banholzer (These ARCHIVES, xxii., p. 212, 1893) examined another case microscopically which was similar in as much as in both the new-formed tissue in the retina consisted of proliferated Mueller's fibres, connective tissue, and vessels. According to Manz, intraocular hemorrhages stand doubtless in intimate causal relation with the proliferation, as observed in most of the cases published. S. Schultze (These ARCHIVES, xxii., p. 224) considers "the name retinitis proliferans unsuitable for this affection, since an in-

flammation of the retina has never been observed as the primary disease, while retinal and vitreous hemorrhages were always found." He thinks that "the new masses are not inflammatory and exudative, but rather deposits of unabsorbed blood fibrine. The deposits are in intimate connection with the retina, cause atrophy of the nervous elements of the retina, hypertrophy of the connective-tissue elements, and finally become themselves transformed into fibrous cicatricial tissue. In Schultze's paper will be found a review of the latest literature on this subject: Manz, Leber, Alexander, Schleich, Proebsting, Martinet, to which we may add the observations of Knapp (*l. c.*), Chodin (*Jahresber. d. Ophth.*, xxv., p. 370), and the experiments of Colucci, 1894 (*Jahresber.*, xxv., p. 238).

Another very instructive observation of H. Knapp (*von Graefe's Arch.*, xiv., i., p. 256, 1868), must be mentioned, in which also the mathematical formula is given, according to which elevations of the fundus may be calculated in linear measure from dioptometry with the direct method of ophthalmoscopic examination, viz., a refraction of $\frac{1}{30}$ corresponds to 0.62 *mm*, *i. e.*, 1 D to $\frac{1}{3}$ *mm*. A bullet shot of the orbit through the temple had caused a hemorrhage in the sheath of the optic nerve. The blood made its way in the loose tissue between internal and external optic sheaths into the eyeball and settled between retina and choroid towards the macula, where it could be seen with the ophthalmoscope. After five months the blood was transformed into a bluish-white mass, covering the retinal vessels, which emerged from its periphery. It projected 0.62 *mm* and contained new-formed blood-vessels. Knapp considers this "vascularised pseudomembrane" as an inflammatory product to which the blood gave rise, with and without coagulation of the fibrine.

In our case extensive tracts of connective tissue developed on those places of the retina where hemorrhages had been formerly observed, but the proliferation was so extensive and projecting, that they could not be considered merely as a transformation of blood. In accordance with Schultze, I am inclined to think that they partly consisted of the unabsorbed fibrous remains of the hemorrhages and partly of

fibrous degeneration of the underlying retina with hypertrophy of the connective tissue elements of the retina.

In the rabbit (p. 82) the degenerative changes appear somewhat different. The cut surface of the optic nerve is covered with new-formed connective-tissue, which, after a month, fills also the excavated papilla. The nervous fibres of the retina are varicose, the nervous substance is dissolved in drops, and there is a moderate immigration of lymph corpuscles. The remaining retina is without alteration. In later stages the medullary fibres ("Markfluegel") are completely replaced by a thin layer of multicellular connective-tissue. A degeneration of the retina and proliferation of new reticular fibrous tissue was only observed in those experiments, in which a *ciliary* vessel was cut.

This is (as mentioned on page 56), like the glazed opacity of the retina after division of the retinal and not the ciliary vessels (in rabbits), another proof that the ciliary vessels in the rabbit supply the greatest part of the retina, save the medullated fibres, which in man is accomplished by the retinal vessels alone. The supply of the human retina by the retinal vascular system is much more favorable than in the rabbit.

Later on detachment of the retina (as observed by Manz) and phthisis of the eyeball may be expected in our case, since at times it showed hypotony. Differing from the others we had hardly any pigmentation of the retina in our case, except a few spots at the white fibrous tissue and some at the grayish new-formed tissue. As, according to Wagenmann, pigmentation is always due to changes in the pigment layer which derives its nutrition from the choroid, and therefore is due to affections of the ciliary blood-vessels, a complication which all the cases so far published presented, it proves that the affection in our case was chiefly confined to the central retinal vessels. This is also in favor of injury of the retinal vessels within the optic nerve, where they are more isolated than before their entrance into the nerve, where it would have been more likely that more branches of the ophthalmic artery would have been ruptured from which the ciliary vessels arise.

EXPLANATION OF THE ACCOMPANYING PLATE.

Fig. 1 represents the erect image of the fundus on December 30, 1895. Indistinctness of the disc, milky opacity of the posterior portion of the retina, tapering of the blood-vessels towards the disc into thin axial columns of blood. Interruption of the blood column and fusiform accumulations of blood in the veins, and retinal hemorrhages mostly along the veins.

Fig. 2, erect image of the fundus on November 7, 1896. The optic disc and its vicinity towards the nasal portion are covered with white connective tissue (prominent 2.00 D = $\frac{8}{3}$ *mm*). A few blood-vessels partially pass over it, partially are hidden by it. New formation of blood-vessels here, at the disc, towards the macula, and at the large gray mass of connective tissue which extends downwards and towards the temple (projecting 6.00 D = 2 *mm*). The retinal vessels are mostly transformed into white fibrous cords. A few hemorrhages.

A CASE OF BILATERAL NON-SUPPURATIVE DACRYOADENITIS (MUMPS OF THE LACHRYMAL GLANDS, HIRSCHBERG).

By ROBERT L. RANDOLPH, M.D., of Baltimore, Md.

DACRYOADENITIS is such a rare affection that I thought the following case worthy of record. The rarity of the disease may be realized when Arlt, one of the greatest of clinicians, declared in his text-book that he had never seen the disease. Prof. Rudolph Schirmer, in his well-known article on the diseases of the lachrymal organs in Graefe and Saemisch, reports only three cases, and Hirschberg,[1] in 1879, reported one case of non-suppurative inflammation of the gland among 22,500 eye cases. Chronic enlargement of the lachrymal gland resulting from a long-existing keratitis or from a dacryocystitis has been observed not infrequently, and I have seen one such case.

Acute purulent inflammation of the lachrymal gland is rare, but still more rare is the sub-acute non-suppurative variety of the disease, and under this head belongs the case which came to the Dispensary of the Johns Hopkins Hospital on September 15, 1896.

The patient was a large negress, thirty-nine years old, a widow with three children. Early in July she had been troubled with pains down both sides of her face and over the eyebrows, and later on in the month a swelling began to appear at the outer canthus of each eye. This swelling kept on getting bigger till about the middle of August, when it came to a standstill. The pain at this time was intense, yet it was never located in the gland but down the sides of the face and across the forehead.

There seemed to be no periodicity in the pains. No history of syphilis was given, but she had been subject to attacks of rheumatism for years, and beyond this her history was negative in so far as throwing any light upon her trouble was concerned.

One observed a hard, rather nodular, and perfectly immovable tumor, decidedly painful to pressure. This condition was present on both sides, and from its location and shape there was no doubt about its being the lachrymal gland. The tumor extended from the median end of the orbital rim to a point apparently beyond the external end of this rim, the dimensions being as follows: On the right side its lateral diameter was 2.4 *cm*, and the vertical diameter was 1.4 *cm*; on the left side the tumor was 2.5 *cm* laterally, and 1.5 *cm* vertically. The mass was sharply circumscribed and the skin covering it was stretched very tense. The pressure exerted by the tumor upon the left eye was sufficient to turn the eye inward and slightly downward. The conjunctivæ were red but not markedly so, nor was there any noticeable increase in the secretion of tears. The outer half of both upper lids nearly touched the lower lid, owing to the swelling, and only the inner half of the eye could be seen. This was especially noticeable in the left eye. It was impossible to evert the lids.

I may add that the patient in other respects was quite well. She was put on small doses of bichloride of mercury and ten grains of iodide of potassium three times daily, and she was directed to make hot applications (hot water) to the tumors every two hours. This treatment was kept up for three weeks and on the 9th of October the tumors were half their original size and now, December 10th (nearly six months since the disease began), there is a scarcely perceptible enlargement of the left gland. She opens her eyes readily, and for the past few weeks has been entirely free of pain.

Cases of dacryoadenitis where suppuration of the gland has occurred are undoubtedly to be attributed to infection, and such cases have most often been monolateral. Carré[3] mentions a case where the disease followed erysipelas. Pooley[4] reported a case of dacryoadenitis of one eye due to diphtheritic conjunctivitis in the other eye, and Adler[5] reported a case following measles, while Rider,[6] Galezowski,[6] and Fuchs[7] saw several cases of the disease associated with mumps. Syphilis as a cause has been mentioned by Streat-

field,[8] Adler, and Albini.[9] Gallasch[10] reported a case of dacryoadenitis in a child 4½ years old where there was general glandular enlargement throughout the body, and a somewhat similar case is mentioned by Scheffels.[11] Cases like the one which I have just described in this paper are not apt to be due to acute constitutional affections, and hence their origin is somewhat obscure. Similar cases are reported by v. Reuss,[12] Hutchinson,[13] Gayat,[14] and others.

[1] ARCH. OF OPH., vol. vii., 369, 1879.
[2] *Gaz. d'Ophth.*, 1882, Nr. 5.
[3] *Trans. Amer. Opth. Soc.*, 1885.
[4] *Dritter Bericht des Krankenhauses Wieden.*
[5] *Trans. Med. Soc. State of N. Y.*, Albany, 1872.
[6] *Recueil d'Opht.*, 1886, p. 415.
[7] *Beiträge zur Augenheil.*, H. iii., 1891.
[8] *Brit. Med. Jour.*, ii.
[9] *Annal. di Ottalm.*, 1887, xvi.
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[11] *Centralbl. f. prak. Augenh.*, 1890, S. 136–137.
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PHTHISIS BULBI, FOLLOWING DIPHTHERITIC INFECTION.

By PERCY FRIDENBERG, M.D.,

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(*With Figs. 1–3, Plate X.*)

WE designate as ocular marasmus, atrophy of the globe, or phthisis bulbi, a condition of general post-inflammatory degeneration of the eye associated with more or less marked decrease in size. Aside from those obscure and often transitory cases of softening, which, more for want of a better name than by reason of accurate pathological description, have been placed in this category under the name of "essential phthisis," this condition is most frequently caused by extensive perforation of the cornea, with subsequent infection and purulent inflammation of the entire globe. The literature on this subject shows that the original affection may be of a widely varying nature, the most usual forms being gonorrhœal conjunctivitis, hypopyon keratitis, extensive burns, and infected wounds. Diphtheritic conjunctivitis, which causes such marked changes in the superficial membranes of the eye, seems to lead but rarely to intraocular degeneration, judging by the very small number of cases reported.

Through the kindness of Dr. E. Gruening I have been enabled to examine an eye which was entirely destroyed in consequence of infection by diphtheritic virus, and had to be enucleated about five weeks after the first symptoms were observed, on account of persistent tenderness and irritation.

In view of the unusual ætiology of this case, as demon-

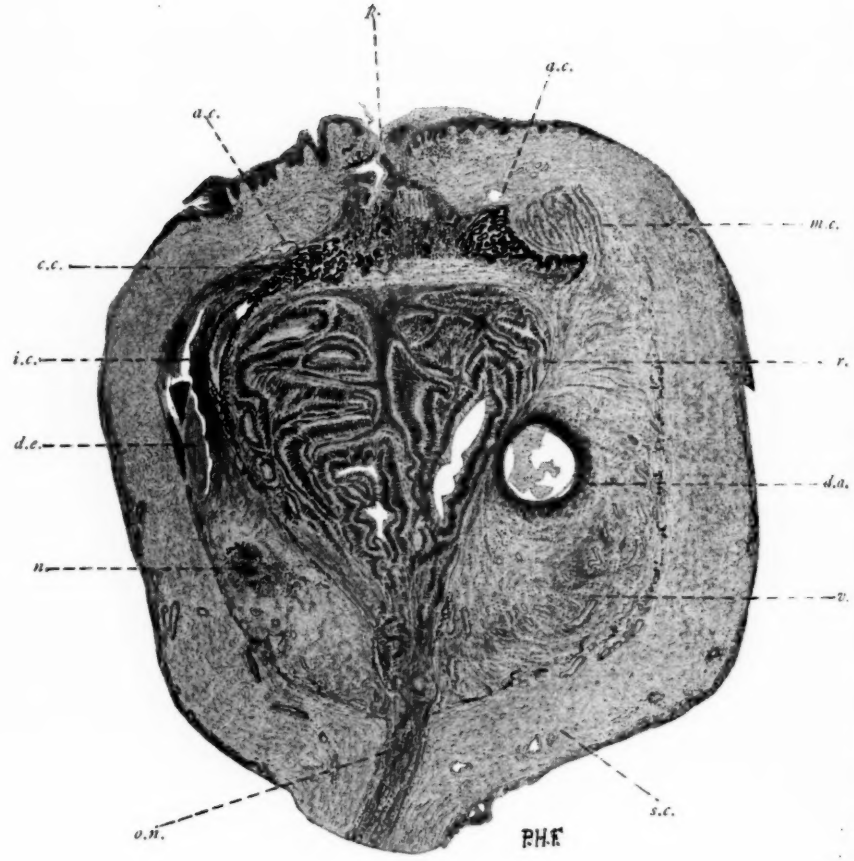

FIG. 1.

strated by the presence of Loeffler's bacillus in the microscopical sections, a detailed account of the pathological changes observed may prove of some interest.

Lily Schwartz, aged fifteen months, was admitted to the eye wards of Mt. Sinai Hospital on December 17, 1895. The following very meagre details of the history were obtained :

About one month ago the child contracted diphtheria. False membranes formed on the conjunctiva of the left eye, and later on the cornea. The child was treated at the Willard Parker Hospital.

Present Condition.—The false membrane has destroyed the whole of the cornea. The iris is shrivelled up. The eyeball is very small and much contracted ; the surface flattened. The eye is painful, but there is no process of inflammation.

December 19th.—The atrophic globe was enucleated, in ether narcosis, by Dr. Gruening.

To supplement this very unsatisfactory clinical report, I addressed an inquiry to the Willard Parker Hospital, but was unable to elicit any further information.

The globe was placed in Müller's fluid, where it remained for nearly ten months, when I obtained it for microscopical study. It was then placed in alcohol of increasing concentration, and imbedded in celloidin. Sections were cut and stained with hæmatoxylin and eosin, and by Loeffler's and Gram's method.

Macroscopic Examination.—The globe is hardly larger than a hazel-nut, of an extremely tough consistency, and irregularly cuboidal in shape. The anterior segment is quite flat. Antero-posterior diameter, 11.6 *mm ;* transverse, 9.7 *mm ;* vertical, 10 *mm.*

On bisecting the globe the interior is found to be quite solid. There is no trace of an anterior chamber or of a vitreous cavity, the space normally occupied by the latter being filled with dense fibrous tissue and by the folded retina (Fig. 1). The retina (*r.*) has become completely detached except at the nerve-entrance (*o. n*), and at points corresponding to the ora serrata. It has become reduplicated and compressed by the shrinking globe, and now

appears as an almost solid funnel-shaped mass occupying the middle of the globe. The base is directed forward, and is separated from the iris and from the structures about the perforation by a transverse bar or diaphragm of fibrous tissue; the apex is continuous with the optic nerve. The sclera appears unusually thick in comparison to the size of the globe. It shows no reduplication or other noticeable irregularity of structure. There is, however, a marked deviation from the normal form, depending on the cuboidal shape of the globe. This is expressed in the cross-section by an abrupt flattening of the anterior segment, so that the approximately square appearance results, which has been described as phthisis quadrata. The angular transition corresponds to the insertion of the recti muscles near the equator. The surface of the cornea is irregular and opaque, and shows a small fistulous track leading into the interior.

Microscopic Examination.—Before describing the minute changes observed in the different tissues it is well to consider the topographical relations of the structures. The pathological process expresses itself most evidently in abnormal position and distribution of practically all the internal tunics of the eye, while the sclera has remained relatively undisturbed. The anterior segment of the globe shows a condition resulting from an extensive perforation of the cornea with a total prolapse, and degeneration of the adherent iris (Fig. 1, *r.*). The gap in the superficial tissues is partly filled by a fibrinous exudation near the level of the anterior epithelium, and at a lower level by pus and granulation tissue. The lowest or innermost part of the wound plug consists of the infiltrated iris. To either side of this plug a small irregularly triangular space is seen bounded in front by corneal tissue, behind by the iris, and externally by remnants of the ciliary body. This formation indicates the angle of the anterior chamber (Fig. 1, *a. c.*).

The ciliary body appears very much compressed. On the temporal side it ends abruptly in a matrix of connective tissue. On the nasal side the conditions are more complicated. The ciliary processes (*c. c.*) are atrophic and wedged into the neighborhood of the anterior perforation, incar-

cerated, as it were, by the connective-tissue diaphragm, or bar spoken of above. There seems, however, to have been traction toward the posterior portion of the globe, as the pigment epithelium layer of the ciliary body can be traced back in a curved line bounding the funnel-shaped retinal detachment. Just behind the ciliary muscle this structure encloses a cavity containing a sero-fibrinous exudation. The cavity is nearly 2 millimetres long, about .6 wide at the middle, tapering to both ends. Its form may be called a meniscus, which presents its concavity toward the interior of the globe. The boundary wall appears as a thick, black line (Fig. 1, *l. c.*). Just external to the cystic formation, and somewhat nearer the posterior pole, a *somewhat larger* and *irregular* cavity is found, bounded externally by sclera and internally by connective tissue. The wall of this cavity is not pigmented. There is a hemorrhagic extravasation of large size in the interior. This subscleral hæmatoma measures 2.75 by 0.75 millimetres (*d. e.*). It is separated from the cyst of the ciliary process by a thick band of connective tissue running back from the ciliary muscle into the region formerly occupied by the vitreous. There is no trace of the lens, although at one or two points to be referred to below, tissue is found which may be composed of degenerated lens fibres, or may represent the formation of a structureless glass membrane from proliferation of the cells of the lens-capsule. The interior of the globe is occupied by the detached retina (*r.*), the folds of which have become filled with fluid and are ballooned out in such a way as to simulate a proliferating cyst. The connective-tissue framework of this cystic structure takes the form of branching septa, joining to form a large trunk, which can be traced into the fibrous cyst wall. The base of the funnel-shaped detachment forms a transverse diaphragm (Fig. 1, *d.*), separating the retina from the iris, ciliary processes, and the structure forming the wound-plug. This diaphragm is composed of dense fibrous tissue, enclosing a few elastic fibres and many hyaline fibrils, which bear strong resemblance to the elements of the lens. The detached retina is bounded by a dense mass of newly-formed con-

nective tissue, varying greatly in histological structure at different points. This mass fills out the interior of the globe, and extends to the sclera, although as we approach the latter membrane residual elements of the choroid, especially of the lamina fusca, are found.

In the neighborhood of the equator a small abscess cavity appears encapsulated in the connective tissue just referred to, and surrounded by a pyogenic membrane consisting almost wholly of deeply stained round cells (Fig. 1, *d. a.*). This cavity has an oval form, the long axis placed antero-posteriorly, and measures 1.25 by 1.6 millimetres. The entire globe is infiltrated with round cells, and in many parts of the interior large collections of newly-formed vessels (Fig. 1, *v.*) are found.

The minute pathology of these tissues may now be considered. As the whole globe may be likened to a ruptured vesicle containing inflammatory products, we shall examine, first, the boundary wall (the sclera), then the tissues at the site of perforation, and, lastly, the intraocular exudation, with its different modifications in various parts of the interior, and the degenerated tissues which are found enveloped by this mass.

The sclera (*sc.*) appears uniformly thickened. It measures at the optic nerve entrance 1.8 *mm*, at the equator 1.6 *mm*, and over the anterior segment and at the sclero-corneal margin 0.8 *mm*. This increase in thickness is not due to an inflammatory process, as it is not expressed by an accumulation of cellular elements or newly-formed connective tissue fibres. The nuclei are but slightly increased in size. The course of the scleral fibres is much changed. Instead of a slightly waving but essentially linear stratification, we find a marked crimping of the fibres, so that an almost angular zigzag course results, which may be likened to a regular series of short deep waves. Even the nuclei are affected by this abrupt bending of the fibres, and appear twisted to one side or the other, according as they occupy the hollow or the crest of the curve. The superficial layers are exceedingly vascular, and occasional collections of round cells are found here, as well as in the deeper structures. The anterior seg-

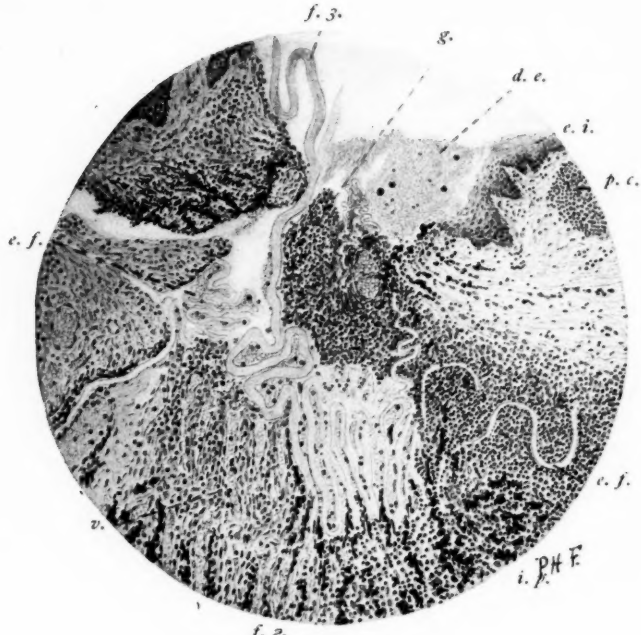

FIG. 2.

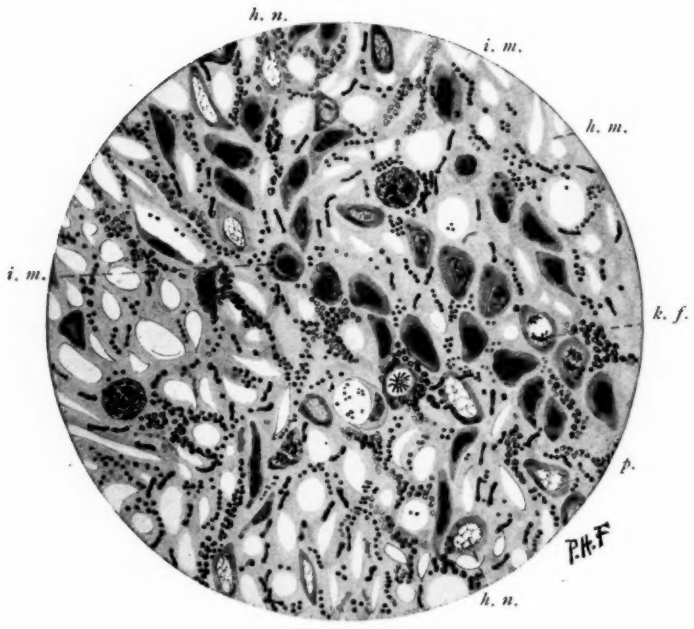

FIG. 3.

ment shows a more regular arrangement of fibres. In the plug of granulation tissue partly filling the perforation (*g.*, Fig. 2), peculiar long structureless bands are found which bear a strong resemblance to the posterior elastic lamina of the cornea. These transparent fibrils present so remarkable an appearance, and are of a nature so foreign to the tissue in which they are found, as to warrant a detailed description. In general they are clear, highly refracting, homogeneous, absolutely anhistous, and about 0.014 *mm* to 0.018 *mm* thick. There is little or no variation in thickness of one fibril. The course is uniformly characteristic, more or less curvilinear, but never wavy. A shape somewhat like that of a capital J, S, or U is found in the deeper parts of the cicatricial plug, which may be caused by natural elasticity plus the pressure on all sides from the granulation tissue (Fig. 2, *e. f.*). Near the centre of the perforation quite a collection of these glassy fibrils is found, arranged very much like hanging coils of rope (f_2), which at one point are straightened out into a long tendril, which may be traced forward to the surface of the globe, where it ends free above the level of the corneal epithelium (f_3). The cicatricial plug is composed principally of round cells with newly-formed connective tissue groundwork and blood-vessels. Near the surface it is covered by a sero-fibrinous exudation containing red blood cells and pigment (*d. e.*).

The choroid, as such, does not appear. We can draw conclusions as to its remaining tissue elements from the presence of numerous flattened, irregularly branched, pigmented connective-tissue cells. These elements appear as dark stellate bodies in the sub-scleral part of that almost homogeneous mass which occupies the interior, together with numerous small blood-vessels and capillaries (Fig. 1, *v.*). The mass itself is composed of connective-tissue fibres, which at one or two points (Fig. 1, *n.*) show a hyaline composition, while at others the more common fibrillary structure is obscured by large aggregations of round cells. The abscess cavity mentioned in the macroscopic examination is found to contain a coagulated sero-fibrinous exudation, with some leucocytes and red blood cells. The lining of this cavity is

a pyogenic membrane consisting almost entirely of round cells.

As both the clinical history of the case and the microscopic changes in the specimen suggested the presence of specific pathogenic organisms, a bacteriological examination was made. Unfortunately the globe had been in fixing media for such a long time (nearly ten months) that no positive result of inoculation or of culture experiments could possibly be expected. For this reason the examination was limited to microscopical study of sections stained with methyl blue according to Loeffler's method. In these sections the presence was established of numerous cocci, in groups and small chains, and of slender rods of about the same length as the tubercle bacillus, but nearly twice as thick; the longer rods appeared to be formed of two segments linked together. Irregular forms were quite common, appearing as rods with clubbed or thickened ends, or as slightly curved tapering cones. Clear spaces were seen in many of the bacilli, the stain showing most intensity at the extremities in almost all cases (Fig. 3). The distribution of the micro-organisms was irregular. They were found most frequently among the round cells filling the perforation, in the granulating iris tissue, and in the exudation filling the cysts and the abscess cavity mentioned above. A few bacilli were found in and about the blood-vessels of the episcleral tissue; none in the retina or optic nerve.

Where the bacilli are found in large numbers, marked changes appear in the stroma as well as in the cellular elements. The ground-substance appears homogeneous and glassy (Fig. 3, *h. m.*). The nuclei of the endothelial cells appear fragmented or hydropic (*h. n.*), with irregular karyokinetic figures (*k. f.*). Some of these cells, as well as others, polynuclear leucocytes, contain cocci in chains (*i. m.*), or hæmatogenous pigment (*p.*).

The history of the case shows that only about one month intervened between the development of diphtheria and the enucleation of an atrophic globe. The rapidity of the panophthalmitic process, as well as the extensive perforation, would in themselves arouse suspicion that we had to deal not only with the bacillus of Klebs-Loeffler, but with

pyogenic micro-organisms as well. The presence of streptococci and of staphylococci in groups throughout the tissues bordering on the perforation, are absolute proof of this mixed infection.

The characteristic tissue changes due to a specific action of the diphtheria germ, have been described by Ribbert, Oertel, Klebs, Welch, and others. Cloudy swelling and coagulation necrosis of epithelial cells, with formation of a pseudo-membrane composed of fibrin in a state of hyaline metamorphosis, are described in similar terms by these authors. The sclerosed connective tissue in the vitreous space, with the pseudo-membranous deposits, as described above, would show that the specific action of Loeffler's bacillus on the tissues of the eye is in nowise different from that observed in other organs. As to its share in the production of a purulent destruction of the cornea with perforation, there can be, in this case at least, no direct evidence. In all probability, pyogenic micro-organisms have played the principal rôle in this destructive process. Still it must be borne in mind that a tendency to necrosis and perforation is produced by impairment of the corneal nutrition due to the diphtheritic infiltration of the surrounding conjunctiva, and not directly dependent on the pus-cocci.

Description of Illustrations.

FIG. 1.—Horizontal section of phthisical globe. (Zeiss Obj. a_3, Oc. 1.)

p. Corneal perforation. *a. c.* Anterior chamber. *c. c.* corpus ciliare. *m. c.* Musculus ciliaris. *r.* Retina. *d. e.* Diphtheritic exudation. *d. a.* Abscess cavity. *n.* Nerve in cross-section surrounded by pigment and hyaline connective-tissue. *v.* Blood-vessels. *sc.* Sclera. *o. n.* Optic nerve.

FIG. 2.—Anterior segment of globe. (Zeiss A, oc. 2.)

e. f. Elastic fibres. f_2, f_3, Long elastic fibre protruding from perforation. *g.* Granulation tissue. *d. e.* Diphtheritic exudation. *e. i.* Denuded and inverted epithelium of cornea. *p. c.* Pus cells. *v.* Proliferating vessels in iris granulations.

FIG. 3.—Klebs-Loeffler bacilli and cocci in diphtheritic tissue. (Zeiss, Homog. Num. $\frac{1}{12}$, oc. 4.)

p. Pigment. *h. m.* Hyaline membrane. *h. n.* Hydropic nuclei. *i. m.* Intra-cellular micro-organisms. *k. f.* Karyokinetic figures.

ON THE PATHOLOGICAL ANATOMY OF THE INTRA-UTERINE DISEASES OF THE EYE, AND PARTICULARLY OF CONGENITAL OPACITY OF THE CORNEA.[1]

By Dr. ALEXANDER TEPLJASCHIN, Kasan.

(*With Plates VII. and VIII. of Vol. XXX., Germ. Ed.*)

Translated, abridged, by Dr. Ward A. Holden.

CONGENITAL opacities of the cornea, particularly when not associated with changes in the curvature and size of the cornea, are rare. Two forms are distinguished, a marginal and a total opacity. In the first sort the opacity forms either a complete ring or only a crescent above and below near the corneal margin, the cornea gradually becoming transparent towards its centre.

In most of the observed cases of the second sort of congenital opacity of the cornea, the cornea was only slightly opaque, and bluish white, the least transparent portion being the centre. Cases of congenital total opacity are extremely rare. (Manz.)

It is supposed that the congenital opacities of the cornea may be either of an inflammatory or of a non-inflammatory nature.

De Wecker distinguishes three groups of the inflammatory opacities:

1. Congenital opacities of inflammatory nature combined with various degrees of buphthalmus.

[1] From Dr. Mitvalsky's laboratory at Prague.

2. Congenital true leucoma adhærens, as a consequence of embryonic perforation of the cornea, and

3. Congenital opacities caused by interstitial keratitis, which may develop in the fœtus in consequence of hereditary syphilis.

The congenital opacities of non-inflammatory nature are usually found with other congenital anomalies, and are due to developmental disturbances. (Fuchs.)

Steffan saw a central opacity of each cornea in a new-born infant, and after death found that the lens lay immediately against the cornea, there being no other anomalies.

Lawrence explains the non-inflammatory congenital opacities as being a residuum of the normal fœtal opacity of the cornea.

Through the kindness of Dr. Mitvalsky, I was permitted to examine the two eyes of a new-born infant with congenital opacities of both corneæ. The infant had no other anomalies, and it died of lung trouble on the third day. The parents were healthy, and denied a syphilitic taint. The cornea and the eyeballs themselves were of normal size.

Sections of the cornea show it to be nearly normal in structure in the periphery except for some small vascular twigs in the middle layers. In one section a twig is given off from a large vessel at the sclero-corneal margin, and extends nearly to the centre of the cornea (Fig. 1, Plate vii.).

In the anterior and middle layers of the central portion of the cornea are more cellular elements, and important changes are found in the posterior layers of the stroma (Fig. 2, Plate vii.). Here there are numbers of elongated nuclei, and the posterior layers seem to be rather fibrous than lamellar. The membrane of Descemet is thin in its central part, and lying on the endothelium are round cells, scattered and in groups.

In the stroma of the iris there is a moderate infiltration of round cells, and near the pupil there is an elevation of the tissue, containing a small vessel (Fig. 3 *a*, Plate vii.).

There is also a moderate infiltration of round cells both in the muscular and connective-tissue portions of the ciliary

body, and also in some parts of the choroid. At some points the lamina supra-choroidea is not loosely meshed, but is a dense connective-tissue structure which can scarcely be differentiated from the sclera. The other portions of the eye are normal.

In the left eye the changes in the cornea are less marked than in the right, and are of a different character. Here the increase in cellular elements in the posterior layers is only in a small field below the centre of the cornea, and there is no vascularity. The greatest infiltration in the iris is at a point below and inward from the pupillary margin. Here the infiltration in its substance and the deposit on its surface produced an elevation in the form of a nodule (Fig. 5, Plates vii., viii.), which pressed upon the posterior surface of the cornea. There are changes in the ciliary body and choroid similar to those in the other eye.

The important changes found in the posterior layers of the central portion of the right cornea were without doubt the cause of the congenital opacity, but the question arises, were the changes the result of fœtal pathological processes or do they represent a congenital lack of development of the cornea. The eyes were from a fully developed infant born at term and there were no other ocular anomalies that could account for delayed development of the cornea. The right eye indeed had a nodule on the iris (Fig 3, Pl. vii., viii.), which might have been considered to be in genetic relation with the persistent pupillary membrane, although this latter is said never to be accompanied with opacity of the cornea except when some portion of it is adherent to the cornea. In our case, however, only a bit of pupillary membrane was present and this was not adherent to the cornea. In favor of the view that the opacity was due to a pathological process, speak the changes found in other parts of this eye as well as those in the cornea and other parts of the second eye.

Pathological changes localized in the deep layers of the cornea, with the other layers normal, are found in diffuse interstitial keratitis, severe iridocyclitis, the presence of exudation in the anterior chamber, large depositions on the posterior surface of the cornea, tumors, etc. The slight

changes in the iris and ciliary body of this eye, the absence of exudation in the anterior chamber, and the normal position of the iris, together with the marked structural changes in the posterior layers of the central portion of the cornea, seem to point definitely to a diffuse interstitial keratitis in the right eye.

In our case the vessels of the cornea were very few in number, while in most of the eyes with interstitial keratitis that have been examined microscopically, many vessels were found. This difference is, no doubt, due to the different degree of development of the process. As is known, when interstitial keratitis begins in the centre of the cornea, the periphery may only be involved late, and the vascularization of the cornea may be much delayed. The number of cellular elements with elongated nuclei, and the fibrous character of the cornea, together with the slight degree of vascularity, lead us to the conclusion that we have to do with an initial stage of interstitial keratitis. And the existence of evidences of chronic inflammation in the uveal tract make it seem very probable that this was an interstitial keratitis of heredito-specific origin.

The changes in the other eye are apparently of a different nature. There was an increase in cells in one portion of the left cornea, but no vascularity as in the right; and corresponding to the altered area of the cornea there was a nodule on the surface of the iris, probably of gummous nature, and extending forward to the posterior surface of the cornea. We know from Leber's experiments that disturbance of the corneal endothelium permits the aqueous humor to pass into the cornea and cause an opacity, and Fuchs has described a variety of keratitis which he calls "keratitis originating in the posterior wall of the cornea." This opacity of the cornea would then seem to have been due to the pressure of a gummous nodule of the iris upon the posterior surface of the cornea.

The conclusions to be drawn from the study of these eyes are as follows. The congenital opacities of the cornea in both eyes were of inflammatory nature, the result of pathological changes in the cornea in utero. They were accom-

panied by inflammatory changes in other portions of the eye.

The opacity in the right cornea was caused by a diffuse interstitial keratitis, while the opacity of the left cornea was due to changes that may be called a "keratitis originating in the posterior wall of the cornea." The other inflammatory changes found in both eyes may be considered as evidences of the action of hereditary syphilis.

In Dr. Mitvalsky's collection are two other eyes with congenital opacity of the cornea, one microphthalmic, the other cyclopic, which I will describe but briefly, as one has already been described in detail by Dr. Mitvalsky and the other will be. The cyclopic eye is not truly cyclopic, at least in its anterior portion, but rather two eyes joined laterally, there being two corneæ, each somewhat smaller than the normal. In transverse sections the appearance of the two corneæ is the same. The outer periphery of both corneæ is of normal thickness, but the centre is thinner, and here the structure is also abnormal (Fig. 6, Pl. vii., viii.). The anterior epithelial layer is thinner, Bowman's membrane can hardly be distinguished, and the anterior and middle layers of the cornea are entirely fibrous. This condition continues through the nasal half of each cornea. The appearance indicates that there has been a delayed development in the inner halves of the corneæ, due no doubt to a diminished nutritive supply on that side.

In the microphthalmic eye, the posterior layers of the cornea are normal, the middle layers contain cells and blood-vessels, while the anterior layers of the stroma are decidedly fibrous and irregular, and are covered with a peculiar layer of epithelium. In both of these cases of arrested development, in which the congenital opacity of the cornea was non-inflammatory, the anterior layers of the cornea were the abnormal ones, while the posterior layers were normal, just the reverse of the condition found in the opacities due to inflammation.

In conclusion I wish to express my thanks to Dr. Mitvalsky for his kindness in giving me this rare pathological material and in aiding me in my investigations.

Explanation of the Figures, Plates VII., VIII.

FIG. 1.—Peripheric portion of the cornea of the right eye. A small vessel passes from the deep layers of the periphery of the cornea forward and inward into the middle layers. The membrane of Descemet has been detached in preparing the specimen.

FIG. 2.—Central portion of the cornea of the right eye. In the posterior layers are the changes indicative of incipient interstitial keratitis.

FIG. 3.—Pupillary portion of the right iris (*A*), moderately infiltrated, and the lens capsule (*B*); at (*a*), a bit of pupillary membrane, and at (*b*) particles of pigment adherent to the lens capsule.

FIG. 4.—The choroid of the right eye. The oval nuclei of the inner layer are increased in number, the supra-choroidea has the character of dense connective tissue, and is not sharply differentiated from the layers of the sclera.

FIG. 5.—A transverse section through the gummous nodule in the left iris.

FIG. 6.—Central part of the cornea of the cyclopic eye.

FIG. 7.—Central part of the cornea of the microphthalmic eye.

A bibliography of twenty titles follows.

THE ETIOLOGY OF RETINAL STRIATIONS, WITH REPORT OF CASES.

By Dr. L. CASPAR of Mülheim-on-the-Rhine.

(*With plates V. and VI. of Vol. XXX., German Edition.*)

Translated by Dr. Ward A. Holden.

FOUR years ago I reported in the Helmholtz *Festschrift* a case of striations in the retina (Jaeger) or, as I termed it, chorio-retinitis striata, the pathogenesis of which could not be determined. The process was one that had run its course, and the history given by the patient threw no light upon its development. There remained therefore nothing but to consider it a chronic inflammatory process in the choroid with secondary involvement of the retina, although the peculiar course of many of the striations seemed to fit neither the anatomy of the choroid nor that of the retina.

That we had to do here with the final stage of a spontaneously cured detachment of the retina did not seem probable to me, notwithstanding the fact that the other eye had a detachment. Nor did Jaeger (Atlas, Pl. xvi.), whose cases alone were known to me then, speak of a previous detachment.

Leber (Graefe-Saemisch, v., p. 639), however, had expressed the opinion that the yellowish- or bluish-white figures sometimes found between retina and choroid in cases in which the detached retina is becoming reapplied, may be identical with Jaeger's retinal striations and may owe their origin to coagula of fibrin deposited in the sub-

retinal fluid. He supports this opinion by a statement of Liebreich's (*Græfe's Archiv*, v., p. 251) in 1859, to the effect that when the retina becomes reapplied after the disappearance of the sub-retinal fluid, the deposits in the latter may remain as bluish-white stripes between retina and choroid. One sees then at times after recovery from detachment, striped figures of this sort scattered over a considerable portion of the fundus, and these are of value in diagnosticating the condition which has previously existed.

The matter, however, has been overlooked to a considerable degree, as Panas in his comprehensive text-book states that the etiology of the affection is still unknown; and the reason for this is that the disease is but seldom seen and opportunities to follow its development with the ophthalmoscope will be most rarely offered. By chance, however, since my previous report, four new cases of chorio-retinitis striata have come under my observation. In part these cases showed the course of their development so plainly that I do not hesitate to contend that all retinal striations or chorio-retinitis striata represent the residua of cured detachments of the retina. In one of my cases the transformation of coagula of fibrin, after detachment of the retina, into typical retinal striations took place almost under my eyes, while in a second case in which there was a partial detachment, the transition from coagula showing through the detached retina, to the white striations in the reattached retina, could be at points followed most clearly.

Case 1.—A woman of fifty-one, always myopic, complained of failure of sight in the left eye for three weeks. R. myopia with posterior staphyloma. V. $= \frac{5}{18}$ with $-$ 8 D. L. excentric fixation, V. $= \frac{1}{30}$. The entire lower half of the visual field wanting under diminished illumination. There was a flat detachment of the upper half of the retina from the disc to the periphery, dull blue in color, without undulations, the vessels darker than normal. Above the macula a straight lustrous bluish-white stripe ran obliquely upward and outward beneath the retina. The detached portion of the retina passed over into the undetached without a sharp line of demarcation. Treatment consisted of diaphoretics, hot foot baths, and regulation of the diet.

Two weeks later the picture was considerably changed. The defect in the field was reduced to the lower-outer quadrant. V = $\frac{4}{10}$. The appearance of the fundus is shown in Fig. 1, Pl. v, (erect image). The flat detachment reached only to a point 3 PD from the disc, and included the upper-inner quadrant and $\frac{2}{3}$ of the upper-outer quadrant. The color of the detached retina differed but slightly from the rest. In the portion of the retina previously detached to the nasal side of the disc, ran a number of darkly pigmented, broad but short stripes, to mostly horizontal. Other pigmented stripes, branched and less sharply limited, passed outward and upward from the macula. Between the latter were three long, sharply outlined white stripes, branched and bordered with pigment, running in a radiating direction toward the disc but not reaching it. In the largest of these stripes could be recognized the line seen two weeks before beneath the retina.

Case 2.—A man of thirty-five complained of conjunctivitis in his right eye. When examined, the left eye, which had been injured by a gas explosion six years before, was found to have only excentric fixation. The appearance of the fundus in this eye is shown in Fig. 2, Pl. v. Two broad pale-yellow bands bordered and mottled with black, curve one upward and one downward from the disc, growing broader toward the periphery, each somewhat resembling the tail of a comet. Below, and to the right (temporal) side, the retina is detached but not much elevated. Here, running beneath the retina, are a number of narrow bluish-white stripes having mostly a vertical direction. Similar shorter white stripes are found on the broad yellowish and pigmented bands which extend upward and downward from the disc.

This ophthalmoscopic picture does not indicate the bounding of the normal retina from the detached by an organized chorio-retinitic exudation, which is not uncommon and which, according to Leber, may guard the retina from further detachment. But it is rather to be considered the transformation of a subretinal stripe into a retinal striation which latter can, therefore, only be regarded as having arisen from an organized coagulum. Further, as to the development of typical retinal striations in the region of the exudation. Taking into consideration the distortion of the vessels here, one would conclude that originally the retinal striations developed in a more extensive field, and that

later, as the inflammatory exudation became shrunken, the striations were brought closer together and were enclosed in this wall.

A very welcome addition to cases 1 and 2 is

CASE 3.—A man of forty-two came under my treatment for left lagophthalmus, keratitis, and iritis. R. media clear. V = $\frac{8}{200}$. The fundus as shown in Fig. 3, Pl. vi. Optic disc atrophic. From it extend two broad bands of organized exudation, growing wider toward the periphery, where they end in accumulations of pigment. One extends upward and outward, the other downward and inward. The upper-inner third of the fundus included between them is normal. Outward from the disc, however, are a number of tendinous white stripes in the retina, having a straight or slightly curved course. Some of them are bordered with pigment. Along one exudation-wall lies a long regular striation, as straight as a string, extending far into the periphery, while in the other wall are several interlacing striations. The patient's lack of intelligence prevented me from getting any history of the case.

It should be noted that in cases 2 and 3 no change took place in the fundus during the many weeks they were kept under observation.

From what has preceded, it is clear how Case 3 is to be interpreted. There was originally a detachment of the retina involving all but the inner-upper third. The two exudation-walls definitely indicate such a partial detachment. The retina later became reapplied with the organization of some fibrinous stripes left between retina and choroid.

In speaking of the organization of coagulated masses, I do not mean to claim that fibrin may be directly transformed into connective tissue. This expression has been employed only for the sake of brevity. It is evident that such stripes of fibrin may be replaced by connective tissue from the choroid growing into them, with which process there would naturally be, as with plastic processes in the choroid in general, a displacement as well as a proliferation of uveal pigment. We need not consider these processes here, but it is sufficient for us to regard as firmly grounded

the view, in the light of the three reported cases, that the so-called retinal striations represent nothing but a rare final stage of detachment of the retina. Hereafter there will be no occasion for anyone to speak of a distinct chorio-retinitis striata.

A fourth case that was seen last year shows how the healing process may remain half finished. The patient declared that he had been almost blind in one eye from early youth. $V = \frac{8}{60}$, excentric, with the retina totally detached, except just above and outward from the disc. In this place there was a lustrous white retinal striation, continuous with which were some coagulation-figures beneath the detached retina. The appearance of this striation may be judged from the fact that it had years before been mistaken for a congenital rupture of the choroid. Its relation to the neighboring coagulation-figures, however, left no doubt as to its true nature. The visual field was much narrowed, particularly above. The other eye had normal vision. Further notes of the case are wanting, since it was only under transitory observation.

THE REMOVAL OF A PIECE OF STEEL FROM THE INTERIOR OF THE EYE BY THE USE OF THE ELECTRO-MAGNET OF HAAB.

By JOHN E. WEEKS, M.D., New York.

(*With two figures.*)

August S., æt. fifteen years, came to my office on May 3, 1896, and gave the following history: About eighteen hours before, while playing with two hammers, striking one against the other, a bit of steel broke off and struck him in the left eye. The patient first visited the Manhattan Eye and Ear Hospital, and afterwards consulted Dr. Herman Knapp, who kindly sent him to me with the request that a trial be made to remove the foreign body, with the large electro-magnet in possession of the New York Eye and Ear Infirmary.

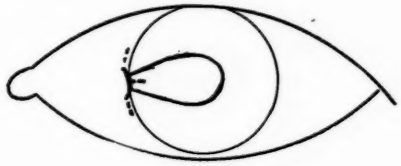

Fig. 1.

The heavy curved line at the limbus represents the original wound; dotted lines indicate the direction and extent of the enlargement.

St. pr.—A small curved wound two and one-half millimetres in length, from which a bead of vitreous and a piece of iris protrudes, is observed at the limbus conjunctivæ to the inner margin of the cornea and on the horizontal meridian of the globe (see Fig. 1). The anterior chamber is partly filled with blood. Pupil oval and drawn to the nasal side, it measures five by eight and

one-half millimetres. There is some blood in the vitreous chamber. Tension — 2. Vision = $\frac{1}{\infty}$ perception of light.

The patient was immediately sent to the Eye and Ear Infirmary, admitted on my service and prepared for operation. Dr. Knapp and many others were present at the operation.

Under cocaine anæsthesia, the prolapsing iris and vitreous were excised. The wound was then enlarged by continuing the incision in the limbus above and below, two millimetres at each end, and by making an incision two millimetres long into the corneal tissue, at right angles with the vertical incision : the whole forming a T-shaped wound. The patient was then approached to the sterilized point of the large magnet, and when the eye was within about four millimetres from the conical end of the magnet, the piece of steel flew from the wound in the eyeball and adhered to the point of the magnet. The pillars of the coloboma were replaced, the margins of the wound adjusted, atropine instilled and a double bandage applied. The piece of steel measured two and a half millimetres by one and a half millimetres by seventy-five hundredths millimetre. When it is known that the power of attraction of this magnet at its point is five and three-quarters pounds, for a piece of soft iron weighing eight gramms, an idea of the influence exerted on particles of steel in the immediate vicinity of the point may be obtained.

Seven days after the operation the patient left the hospital, the wound had healed and the blood had disappeared from the anterior chamber. The vitreous was hazy and remnants of a clot were present in the inner third of the vitreous chamber. There had been no pain, and no inflammatory reaction after the operation.

On August 26th, a careful examination of the eye was made. The eye was perfectly quiet. The pupil extended to the margin of the cornea and measured four by eight and a half millimetres ; columns of the coloboma free. The lens was perfectly transparent. In the vitreous, well to the nasal side, a white deposit was observed, evidently the remains of a blood clot. The vision with correction (— 1.75 D. ax. 22°) equalled $\frac{20}{30}$ +. The eye has been used with its fellow without discomfort. When last seen, seven months after the accident, the conditions were virtually the same as on August 26th.

In this case, the piece of steel pierced the fibrous coat at the limbus, passed through iris and suspensory ligament

and lodged in the vitreous humor, not injuring the lens (see Fig. 2). The result proved the wisdom of the at-

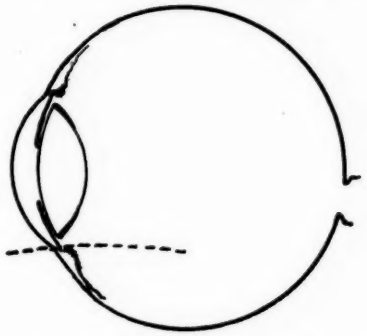

FIG. 2.
Probable track of foreign body indicated by dotted lines.

tempt to remove the foreign body through the original wound. It is seldom that we observe recovery with useful vision, when equatorial openings into the eyeball are employed for the removal of foreign bodies.

SOME REMARKS ON THE CONSERVATIVE TREATMENT OF CERTAIN PROLAPSES OF THE IRIS.

By HERMAN KNAPP.

FOR many years my attention has been aroused by the white clean scars at the periphery of the cornea to which a portion of iris is attached—the well-known adherent leucoma. The level of the cornea is unchanged, the eyeball tension normal, the pupil pear-shaped, but clean and mobile, the sight good, and the eye free from irritation. Not all adherent leucomas are so harmless, but the harmless ones are very numerous. They are the end-stage of a penetrating wound, or a perforating ulcer of the cornea, healed without infective inflammation. The ulcers may, however, have been the consequence of an infective inflammation, for instance of pustular keratitis or blennorrhoic conjunctivitis, but the infection, in these cases, did not penetrate into the interior of the eyeball. I have long made it a point in prolapses of this kind not to touch the protruding iris, for it plugs the gap and thus prevents the contagium from entering into the interior of the globe. I have even seen cases of blennorrhoic conjunctivitis in which a considerable portion of iris lying in a crescentic corneal ulcer of the lower or upper periphery of the cornea, was afterward drawn back into the anterior chamber. The perforation healed with a grayish-white scar, but the pupil became central and round again. These cases are exceptional. The majority heal with an adherent leucoma without serious consequences, others become ectatic and produce glaucoma, others again lead to panophthalmitis. The latter unfortunate

termination, as far as my experience goes, is favored by interfering with the prolapse, be it by cutting or cautery. I have therefore *made it a rule never to cut or burn off protruding iris in any infective conjunctival or corneal disease.* I treat the original disease, instil atropine in moderate quantity to keep the pupil dilated as far as possible without irritating the conjunctiva and producing granulations, and I cleanse the conjunctival sac with a mild antiseptic solution, for instance chloride of sodium (chemically pure)0.40 to 60.00 grams.

Having for years carefully watched the healing process of perforating corneal wounds I venture to put myself on record with the statement *that I do not remember a single case of sympathetic ophthalmia from any kind of prolapse, if the iris had not been wounded by an accident or by the hand of the surgeon.* This statement I beg, however, to consider as personal, for I am only one observer, and the experience of others may differ. In favor of this assertion are certain bacteriological observations which, in the winter of 1885 and 1886, I made in KOCH'S Laboratory in Berlin and later in my own in New York. While studying the action of pathogenic bacteria on perforating wounds of the cornea, especially in cataract sections, I noticed that the corneal tissue adjacent to the wound was densely infiltrated with staphylococcus pyogenes, whereas the tissue of the prolapsed iris was free from them.[1] Guided by these principles I have for a long time been conservative in the treatment of iris prolapse, too conservative probably in one particular field, the iris prolapse following cataract extraction. The prolapses in this field very rarely occasioned the loss of the eye by inflammation, but frequently larger prolapses caused such a disfigurement and so high a degree of astigmatism that the results of the operations left a great deal to be desired. During the last years I have therefore made it a routine practice to inspect every eye a day after the extraction, be there any irritative symptoms or not, and abscise the iris, if prolapsed, at once, provided that there be no sep-

[1] See my paper "On the Action of Bacteria on the Operations of the Eye." ARCHIVES OF OPHTH., XV., pp. 31 and 32.

tic inflammation. In this way the protruding iris can mostly be removed cleanly, *i. e.*, without incarceration of the limbs of the coloboma. My associate at the N. Y. Ophthalmic and Aural Institute, Dr. R. O. Born, has dealt with iris prolapse after extraction in the same manner longer than myself. This management of the prolapse is, in fact, only the application to cataract extraction of a general rule long known and followed by many ophthalmic surgeons, viz.: excise the iris when it is still possible to make a clean iridectomy.

To *restrict this general rule is my chief object in writing this communication.* Whenever a case came under my care in which I could expect that there would be no inflammation and the prolapsed portion of iris small or large be eliminated by nature, I treated the case expectantly as long as no threatening symptoms appeared. This was particularly my rule when the injury did not involve the lens. I have treated in this way not only the prolapsed iris but also the ciliary body. Of the numerous cases of felicitous healing that are at my disposal I beg to detail only two, the one in a corneal, the other a scleral wound.

CASE I.—**Wound through the whole Breadth of the Cornea with Extensive Prolapse of the Iris—Perfect Recovery.**

The right eye of the six-year-old son of General Hy. L. B., of New York, had been hit with a pointed lead pencil. He was brought from Newport to New York the next day, October 26, 1890. A curvilinear wound passed from the temporal to the nasal border through the upper third of the cornea. It was filled with iris; the lens was uninjured, and sight fairly good. There was no irritation. I told the parents that the injury was grave, and the eye might be lost, even the danger of the loss of the other eye from sympathetic affection could not absolutely be excluded. Yet there was a fair prospect to heal the wound without notable disfigurement, and with preservation of good sight. If he were my child, I would treat him conservatively, watch him attentively, and act according to events. The parents said: "We place him into your hands without any recommendation or restriction." I cleansed the eye, instilled atropine and boric acid, bandaged both eyes, and kept the boy, who was an intelligent and tractable

patient, in bed. The prolapse soon began to swell, yet there was no inflammation, the pupil was medium-sized and clear, the vision good, and the fundus oculi normal. Gradually the base of the prolapse contracted, and on the thirteenth day the protruded iris, swollen like a mushroom, began to shrink.

On the *17th day* the prolapse showed a tendency to disappear on the temporal side. The corneal lips of the wound were separated by a thin, filmy, not elevated tissue. On the nasal half the protrusion and swelling persisted. No irritation.

On the *23d day* there was protrusion only on the nasal side. Slight redness and distinct swelling were noticed on the upper and lower margins of the optic disc, and the retina was congested. No irritation.

On the *25th*: Treatment:—strict rest in bed; room darkened. No redness of eye, swelling and congestion of retina less. Tn. V good. The protruded part of the iris on the nasal side of the wound had assumed a cyst-like character, but it also soon began to contract, and had disappeared *forty days* after the injury. The swelling and congestion of the optic disc and retina were noticeable until the *fifty-fourth day* after the operation, when the wound presented a perfectly smooth linear scar in the cornea, the iris was normal, the pupil clear, not drawn upward, though the upper part of the iris adhered to the scar. The media and background of the eye presented no morbid change. On the last of December, 1890, sixty-seven days after the injury, the scar was smooth, the eye perfectly free from irritation, had been used with the other, without discomfort, and had V = $\frac{20}{40}$—with + 2.^{s} + 1.^{c} axis horizontal. Since that time I have seen the patient repeatedly, last in January, 1897. With Placido marked astigmatism with axis against the rule was noted. With ophthalmometer the astigmatism was 7. D, axis 75° temporally. With the opthalmoscope the optic disc appeared vertically oval when seen in the inverted image through the part of the cornea near the scar, but round when seen through the lower part. With + 6. D c 80° temporal deviation V $\frac{20}{20}$. The wounded eye had not changed, and both eyes were used for all purposes without the least inconvenience.

CASE II.—**Large Perforating Wound of Upper Lid and Sclera, with Prolapse of Vitreous and Ciliary Processes—Perfect Recovery.**

Mrs. Mollie W., a thirty-year-old waitress, injured her right eye in June, 1896, at Long Branch. A piece of glass from an ex-

ploding Apolinaris bottle struck the upper lid and the ball of the right eye. Dr. Bennett, residing at the time in Long Branch, had immediately been called. He stitched the lacerated upper lid, and kept the eye closed with a pressure bandage until I saw the patient with him, six hours later. The lips of the perforating wound of the upper lid had been carefully united, the eyeball and lids were free from inflammation, but a perforating wound in the upper part of the sclera extended from near the equator of the globe on the temporal side obliquely forward into the ciliary region on the nasal side. The wound was gaping and filled with vitreous on the nasal and with ciliary processes on the temporal side. Lens and iris were uninjured, sight preserved. The treatment consisted in keeping the eye closed with a compressive bandage, and letting the patient remain in bed for three weeks. During this period the dressing was changed several times. No inflammation setting in, we abstained from any other treatment except the instillation of a drop of atropine now and then. In this way the temporal two-thirds of the wound cicatrized regularly, but the nasal part, where the ciliary processes protruded through the gap, developed into an oblong cyst consisting of ciliary processes and a transparent wall, connected with the edges of the wound and projecting 2–3 *mm* above the surface of the sclerotic.

The eye and sight being in a good condition, but the cyst showing no tendency to disappear, on the contrary, to slowly grow larger, I admitted the patient to the N. Y. Ophthalmic and Aural Institute September 20th, where I exsected the whole cyst clean out of its surroundings, paring the edges of the scleral wound with a strong pair of delicate scissors (Stevens's). No tissue of the ciliary body was left in the wound. Clear vitreous protruded. The wound was not stitched, but left to unite under a simple compressive bandage. The patient was discharged from the hospital October 5, 1896.

On December 22, 1896, I examined her at my office. The whole wound had smoothly cicatrized. The pupil was large, immovable. The fundus was normal. Nothing of the scar could be seen with the ophthalmoscope. The ophthalmometer showed 4. D of astigmatism against the rule in the injured eye, and 1. D with the rule in the other. With $-$ 3.5^{c} ax. 10° of temp. deflection from the vertical meridian before the injured eye V $=\frac{2}{40}-$, with $-$ 1^{c} axis horizontal (with the rule) V $=\frac{2}{40}$ in the other eye

With the injured eye she read Jäger 1 at 6″–9″ with + 3. D, the pupil still being dilated and immovable.

The first case demonstrates that conservative treatment of the prolapse of the iris through the *cornea* may produce results that could not be surpassed, if at all equalled, by any operation. If the latter have the advantage of healing the wound more quickly, I would say that, to me at least, the conservative treatment appears safer and cleaner. It is notable that in seven years the astigmatism had increased from 1. D to 7. D, showing the contraction of the extensive scar.

The second case is an example of the fact that clean perforating wounds of the sclerotic commonly heal kindly, whereas prolapses of the ciliary processes, like prolapses of the iris in the ciliary region, are apt to produce cyst-like ectasias which for their cure require thorough excision.

TRANSACTIONS OF THE TWENTY-FIFTH OPHTHALMOLOGICAL CONGRESS, HELD IN HEIDELBERG, AUG. 5 TO 8, 1896.

REPORTED BY PROF. HORSTMANN AND DR. GREEFF (Berlin).

Translation by ADOLPH O. PHINGST, M.D., Louisville, Ky.

The twenty-fifth meeting of the Ophthalmological Society was characterized by an unusually large attendance and by the large number of papers that were read. Especial interest was added to the meeting by the bestowal of the Graefe medal, which is presented every ten years.

After a few appropriate words of welcome by Dr. Hess of Mainz, the permanent secretary of the Society, Prof. von Hippel of Halle, made the address of the day, in which he eulogized the achievements of A. von Graefe in ophthalmology, and briefly reviewed his illustrious career. At the close of the address the medal was presented to Prof. Leber, who thanked the body in an eloquent address.

FIRST SESSION.

The first business meeting, which was held on August 6th, and presided over by Mr. Swanzy of Dublin, was opened by Dr. Nieden of Bochum, who read a paper on *the use of cancer serum of Emmerich-Scholl and formol in inoperable tumors of the eye.* Nieden cited two such cases from his practice upon which the serum had been used without benefit; in fact, it seemed as though the growth had been more rapid after its use.

The first case was a melanotic sarcoma filling the entire orbit, recurring after enucleation of the eye a year previously. The injection of serum was begun with 1 decigr. and afterwards in-

creased to 2 decigr. The tumor was, after several injections, seen to be growing more rapidly than before.

The second case was a glioma retinæ filling the orbit, which had recurred six weeks after removal of the eye and infiltrated nerve. Fourteen injections, the first in the periphery and then in the growth proper, had been made in four weeks. After the tenth injection a more rapid growth of the tumor was noticeable.

On the surface necrosis of the pseudoplasm had taken place. To overcome the odor in this condition and prevent new tissue involvement a 2 % solution of formol was found to be of service.

2. Prof. HESS, of Leipzig, presented a paper on *some new observations on the displacement of the lens during accommodation.*

Hess observed that the entoptic image of his lens gravitated slightly during accommodation. Accordingly, as the head turned from the erect position toward the right or left side, the lens moved in the same direction. With the head bowed forward it shifted towards the forehead side—a direction just contrary to the one with the head erect. Hess measured the displacement and found it to be from 0.16 to 0.2 *mm.* By the instillation of eserine this could be increased to 0.42 *mm.*

Hess had also, with the aid of new methods, determined the near point of accommodation, and found that it was perceptibly nearer to the eye when the head was lowered than when it was raised. There was a refractive difference of $\frac{1}{2} - \frac{3}{4}$ D. He concluded from this fact that there was a forward displacement of the lens of 0.15–0.18 *mm.*

Hess showed why his experiments refuted the hypothesis of Schön and Tscherning, and expressed confidence in the practical benefits of his researches.

3. Dr. CZELLITZER (Heidelberg) : *On zonular tension and the changes in shape which the lens undergoes during accommodation.*

Stimulated by the recent experiments of Tscherning, contradicting the theory of Helmholtz as to the changes in the shape of the lens during accommodation, Czellitzer made a number of measurements of the lens surface during rigidity and relaxation of the suspensory ligament. He brought about the changes in the zonula in three ways, viz., by increasing the tension in the vitreous chamber or by reducing it in the anterior aqueous chamber, either of which would cause the lens to move forward and stretch the zonula, or by the use of a special devise by means of which he could secure uniform tension or relaxation of the suspensory liga-

ments as he desired. He was also able by means of this apparatus to bring any part of the lens surface into the field of the ophthalmometer (of Helmholtz). The result of these experiments was also contradictory to the theory of Helmholtz. He found that during relaxation of the zonula the radius of curvature of the vertical meridian became larger, and not as Helmholtz had supposed, smaller. It gradually became smaller on both sides of the median line as it approached the zonula attachment; especially was this so of the anterior surface. During tension of the zonula the radii of curvature of the vertical meridians diminished. It was, in other words, the action of the suspensory ligament which caused the increase in curvature of the vertical meridian. This increase extended about 15° to each side of the median line, where there was a zone upon which the tension of the zonula had no effect (*Indifferente Zone*). Beyond this the tension produced a flattening of the surface.

Czellitzer's experiments were made upon calf and ox eyes; nevertheless, if the elasticity of the human lens is nearly the same as in those used in the experiments, we may assume that the changes in the human eye during accommodation do not differ from those in the animal eye, and that the generally accepted theory of accommodation is an erroneous one.

In the discussion Hess and Sattler both expressed the belief that there was considerable difference in the changes brought about by accommodation in man and in lower animals.

4. Dr. VON HIPPEL (Heidelberg): *On the degenerative changes of the retina which result from the presence of particles of iron within it.* (Abstract submitted by author.)

Late researches have shown that the presence of particles of iron in the fundus of the eye could cause total degeneration of the retina, without causing detachment. Earlier observations by other authors have led to a classification of four symptoms in these cases.

(1) Amblyopia, proportionately greater than the changes in the refractive media or the fundus would indicate.

(2) Concentric contraction of the visual field.

(3) Hemeralopia.

(4) Diminished acuteness for the perception of colors.

Von Hippel had gathered 45 cases from the literature in which particles of iron had been carried in the eyes for years, without perceptibly affecting them. No mention was made of symptoms

3 and 4 in any of these cases, but as symptoms 1 and 2 had been noted in 8 of the number, it would justify the supposition that they were cases in which degenerative changes had taken place. The remaining cases showed that bodies may remain in the retina a long time without causing changes. No significance should be attached to the size of the foreign body. None of the eight pieces of iron in the cases referred to had become firmly encapsulated, and some were entirely free. In 15 cases where no degenerative changes had taken place, all of 9 eyes which could be examined showed a dense capsule surrounding the foreign body. Statistics and anatomical examinations by Leber and the author have shown that such capsule formation does not take place when the body introduced is in a sterile condition, but that they are the result of inflammatory action set up by septic material introduced with the body.

Von Hippel observed hemeralopia to be the earliest sign of retinal degeneration. He found it present in a marked degree in 5 and to a less degree in 2 cases. Concentric contraction of the V. F. was present in but 3 of these cases. Whether or not the hemeralopia is always followed by diminution of vision is not positively known.

Discussion : Hirschberg mentioned a case where glaucoma had occurred twenty years after the body had entered the eye, and was not relieved by removal of the body.

Vossius expressed the belief that degeneration precedes the diminution of vision.

Dor gave his results of the treatment of detachment of the retina with Heurteloup and cautery. Nine out of 15 cases had been cured. He pointed out the fact that the vision for colors returns only in new cases. In old cases, though they may be cured, the defective vision for colors remains.

5. Prof. GOLDZIEHER (Budapest) : (1) *On retinitis proliferans.*

Based upon clinical observations, G. refutes the general supposition that the characteristic changes which take place in this disease are caused by recurrent retinal hemorrhages. Even in such cases where hemorrhage is observed during the progress of the disease, there is doubt in his mind as to their relation to the changes spoken of ; they could just as well have resulted from some diseased condition of the retina, causing rigidity of the blood-vessels. It is a noticeable fact that retinitis proliferans

occurs rather infrequently when compared with the large number of retinal hemorrhages, which are seen. Large preretinal clots become absorbed (Haab) without leaving a trace. In syphilitic cases, which differ somewhat from the simple forms (Jaeger, Manz), the specific trouble and not the hemorrhages is responsible for the changes, though the proliferations are adherent to the blood-vessels. They are products of a syphilitic endo- or peri-arteritis.

G. stated further that these cases of proliferation into the vitreous from the retina, following traumatism, are caused by plastic chorio-retinitis. They differ both clinically and microscopically from a genuine or spontaneous retinitis proliferans. There are also cases of this spontaneous variety which have existed for years without a sign of hemorrhage or a diseased condition of the vessels. The author thinks that the changes in these cases are brought about by a proliferation of Müller's fibres.

(2) *Hutchinson's changes in the fundus.* GOLDZIEHER was able to show that the retinal affection described by him under this name (*Wiener Med. Wochenschrift*, 1887), is identical with retinitis circinata of Fuchs. He had observed 9 cases, from which it was evident that the changes were due to a general sclerosis with secondary degeneration of the retina. He sided with Fuchs in that he did not look upon the characteristic specks in the retina as accumulations of fat the outcome of hemorrhages, as was suggested by Wecker. G. thought that a circumscribed breaking down or softening took place in the retina, the same as it does in the cortex of the brain, the result of occlusion of isolated arterioles or capillaries.

(6) Dr. SIEGERT, Bâle: *A rare affection of the retina.* The case had been reported by Weltert (*Arch. f. Augenheilk*, xxxii.) as one of retinitis circinata. There was a white luminous mass at the macula from which numerous stripes radiated towards the periphery. The retinal vessels were in front of both. In the upper and outer periphery of the retina a white patch was seen, with hemorrhages and dilated veins.

The eye trouble was ushered in by sudden severe heart symptoms, from which the child had been a lifelong sufferer.

After the use of iodide of potash for several weeks the stripes referred to became sharply defined and arborescent. Paracentesis of the anterior chamber was then made with the result that the white figures lost their sharp outlines and soon coalesced to

be changed into white dots or beads. The same changes could be brought about with digitalis and caffeine. Under the administration of iodide of potash they returned to the form which the use of this drug had previously given them.

This case was hardly one of retinitis circinata, because in this we never find the macula affected nor have a radiary arrangement of the retinal deposits. The age of the patient and the sudden onset of the condition are also not suggestive of retinitis circinata.

The cited case was supposed by Siegert to be due to a weak action of the heart with consequent disturbance of the circulation in the retinal vessels. The white deposits were supposed to be albuminous transudations and not fatty degenerations. As the retinal vessels had remained visible over the patches the odœma was evidently in the outer layers of the retina and the author has referred to the condition as external œdema of the retina in contradistinction to the internal œdema of the retina accompanying embolus of central artery, etc.

7. Prof. SCHMIDT-RIMPLER (Göttingen) : *Temporal optic atrophy as a complication of diabetes.*

S. had found the nerve affected 34 times out of 140 cases of diabetes. There was, as a rule, a central scotoma for colors brought about by retrobulbar neuritis. On account of this Sch.-R. suggested that diabetes should always be suspected in cases having central scotoma. The urine should be examined frequently and on different days, as it may be free of sugar for several days, and in this way be overlooked. A central scotoma should be accurately tested with small objects. The scotoma in such cases is not, as Mauthner and others have supposed, due to tobacco or alcohol poisoning.

The prognosis of these cases is not unfavorable if the proper attention be given the case. The use of tobacco should be prohibited. The enforcement of a strictly anti-diabetic diet is at the present day not supposed to be of paramount importance.

In a case examined microscopically by the author, in which central scotoma had existed, changes were found in the papillomacular nerve fibres identical with the changes found after amblyopia of intoxication, though there was no history of the abuse of alcohol or tobacco.

In the discussion Leber's views coincided with the above. He called attention to the fact that 30 cases of nerve affection following diabetes observed by him all befell the male sex.

Hirschberg had observed a case in a woman.

Uhthoff emphasizes the fact that there is no difference clinically between amblyopia of intoxication and the scotoma of diabetes.

8. Dr. STRAUB (Amsterdam) *: On hyalitis and genuine uveitis.* The term cyclitis embodies in it to-day cases in which either the vitreous body or the uvea is affected, although more strictly speaking the former is termed hyalitis and the latter uveitis. S. was able in rabbits to produce either condition and to submit the eyes to a microscopical examination. In hyalitis leucocytes were found in the vitreous, retina, and in the capillary layer of the uveal tract. In three of the cases genuine uveitis had occurred, leaving clear vitreous. All of the cases had produced sympathetic ophthalmia.

9. Dr. GREEFF (Berlin) : *Anatomical study of pseudo-glioma and pseudo-growths of the eye.*

From a number of examinations made by G. he concluded that the most valuable means of distinguishing between true and false growths of the eye is the examination of the fresh specimen. In the fresh state true glioma presents characteristics which can be seen macroscopically and which make its recognition easy. It is a soft brain-like mass of a gray color. We are frequently unable to distinguish clinically between glioma and exudative choroiditis as both present the same yellow mass on the interior of the eye. In making a fresh section of an eye containing pseudo-gliomatous exudation, an opaque yellowish fluid escapes from beneath the retina in which a great number of minute glistening bodies can be seen (crystals of cholesterin). A dense layer made up of pus and fat cells, and cholesterin crystals was observed upon the choroidal side of the retina which accounts for yellow mass resembling glioma. In old cases this membrane had become organized. These cases of choroiditis result, as a rule, from some infectious disease as cerebro-spinal meningitis, scarlet fever, measles, tuberculosis, or congenital syphilis. The choroiditis is produced no doubt by an embolus which has been carried into one of the choroidal vessels.

10. Prof. HIRSCHBERG (Berlin) : *On carcinoma arising from posterior layer of the iris.*

A tumor emanating from the posterior or retinal layer of the iris was observed by H. It occurred in a man twenty-six years old, whose vision had been defective for one and a half years. The iris above was pushed forwards against the cornea. After

fourteen days the tumor could be seen as an elevated body upon the posterior surface of the iris. The eye was enucleated for the relief of pain and the growth examined microscopically. It had a spongy texture and emanated from the posterior layer of the iris. The epithelial cells resembled, in their arrangement, gland tubules and alveoli and the growth was consequently looked upon as an alveolar carcinoma. These growths are very infrequent, Michel and Treacher Collins having reported similar cases.

SECOND SESSION, AUGUST 7TH.

1. Prof. SATTLER (Leipzig): *On the elastic fibres of the sclera with demonstrations.* By the use of the method of Spaltenholz, which stains the elastic fibres black with a yellow background, S. demonstrated that the elastic fibres of the sclera are very delicate and that they are arranged parallel to the bundles of connective tissue. There is no bifurcation or anastomosis of the fibres. They predominate near the insertion of the muscles and in Tenon's capsule.

2. Dr. HOFFMANN (Baden): *An operation for the extirpation of the lachrymal sack and one for ectropion.*

The author believes that in suppuration of the sack we can, by its removal through the conjunctiva with canaliculi, make a more aseptic field for cataract operations than by the old method of extirpation leaving the canaliculi. The operation is facilitated by injecting cocaine between the internal palpebral ligament and the sack and in the connective tissue behind the sack. The sack is then removed with forceps and scissors. The conjunctiva should be sutured to the skin, to get union by first intention.

The best operation for senile ectropion is to excise a triangular piece whose apex is directed toward the external canthus and base towards zygoma. Sutures are passed so that in entropion the upper lid overlaps the lower at the outer canthus. In ectropion the lower lid is brought in front of the upper.

3. Prof. SCHIRMER (Greifswald): *A radical operation for circumscribed staphylomas (ant.) of the sclera.*

As the methods of treating staphylomatous conditions of the sclera are unsatisfactory, Schirmer tried the plan of abscission, as it is employed for staphyloma of the cornea. The ectasia must be excised in toto as the walls are too thin to hold sutures. The opening is closed with silver wire and the defect covered

over with conjunctiva to avoid subsequent infection. The wire is removed after 14 days. Schirmer had operated three cases successfully, two of them showing an improvement in vision. Discussion: Schweigger has operated according to this method. He uses cat-gut thread.

4. Dr. AXENFELD (Marburg): *A contribution to the etiology of conjunctivitis.*

The pathogenic agents known to us (Koch-Weeks's bacillus, pneumococcus, streptococcus, Morax diplobacillus, micrococcus conj. minutissimus of Bach) by no means exhaust the etiology of simple conjunctivitis. There is in fact no certainty about the specific character of any of them. Axenfeld has never been able, for instance, to find the bacillus of Koch-Weeks in Marburg. Pneumococcus conjunctivitis was, on the other hand, frequently found. It appeared mostly in children and ran a mild course. The exceptional cases seen in the adult were all more severe. A number of the cases showed a resemblance to phlyctenular conjunctivitis, and in a few there were true phlyctenula present.

The pneumococcus was demonstrable in great numbers during the suppurative stage. They were recognizable by their characteristic shape and arrangement as well as by their reaction to Gram's staining method.

Strange to say, although these organisms were found predominating in two different school epidemics, neither the secreted material nor the organisms obtained in pure culture from the secretion had any effect when inoculated into the healthy eye. The contagious character of pneumococcus conjunctivitis consequently is doubtful. It is possible that through some influence the organisms which are normally present upon the healthy conjunctiva take on such properties as to cause the epidemic.

In the discussion Peters and Fuchs claimed never to have been able to find the Koch-Weeks's bacillus. Peters had often found the diplobacillus of Morax. Von Hippel reported to have seen conjunctivitis set up by virulent diphtheria bacilli without the formation of a pseudo-membrane. Mayweg thought that the epidemics spread by infection through the air.

5. Prof. LEBER (Heidelberg): *The pathology of trachoma.*

Little is known to-day of the etiology of trachoma. Many, including the author, had endeavored to find a specific organism for this disease. It is hard to say which of the many organisms found in the lids has to do with the production of trachoma.

None of them have been found in the tissue proper, although that fact by no means excludes the possibility of their presence there. Leber found peculiar bonnet-shaped bodies filling the follicles, which he termed the corpuscular cells. They are the same bodies which were looked upon by Pfeiffer as parasites, and which Villars called Trachozytes. Their significance is not known. The author at one time thought of the possibility of their being parasites, but abandoned this after having found them in normal follicles.

Discussion : Schmidt-Rimpler suggested that examination into the etiology of trachoma be directed towards the secretion, as it is this which is so contagious.

Sattler said that German of St. Petersburg had found organisms in trachoma which are present in the soil. From this we would infer that the disease has an endemic character.

6. Prof. FUCHS (Vienna) : *Fungus growths upon the conjunctiva.*

Fuchs found small fungus patches upon the convex border of the tarsal cartilage upon several occasions. Upon removing them yellow bodies were seen in the conjunctiva. The patches on the surface were found to contain round and oval bodies (microscopic), which the bacteriological examination (Gruber's) showed to contain a variety of leptothrix. The patches did not return when removed. The yellow bodies in the conjunctiva spoken of were concrements of epithelium. The fungi had not entered the depth.

7. Prof. VOSSIUS (Giessen) : *A case of cyst-formation of the conjunctiva of the upper lid with demonstrations.*

Vossius had treated a patient in which small excrescences were present upon the conjunctival surface of both lids. They could not be scraped off, but burst during the effort to scrape them off, discharging a yellow fluid. The excised bodies were found, microscopically, to be made up of cysts of different sizes. They had no connection with the Meibomian glands. Some of the cysts were separated by delicate septa and some communicated by small openings. There were also openings upon the surface. A double layer of endothelium lined the interior. The fluid contents contained cholesterin crystals, but no micro-organisms. The case was no doubt one of cyst-formation of the glands of Henle.

8. Dr. GELPKE (Karlsruhe) : *On the etiology of acute epidemic conjunctivitis.*

Gelpke had examined the children of two schools during an epidemic of conjunctivitis, in which he found 22 % of the children affected, all within two days. The cases ran a favorable course, terminating in from 7 to 8 weeks.

The discharge was examined bacteriologically. Upon bouillon agar containing about 6 % glycerine, small glossy colonies were grown, which under favorable environments spread over the entire surface. The organism resembled the xerosis bacillus.

Discussion: Peters thought the organism resembled the bacillus of Morax.

v. Hippel, Sr., protested against the promiscuous introduction of organisms of unknown characters into the human eye.

Prof. GRŒNOW (Breslau): *The use of cocaine in glaucomatous conditions.* Text-books warn against the use of cocaine in glaucoma. G. had seen cases where the drug had a beneficial action upon glaucomatous eyes. It is not new to any one that none of the medicinal treatment will cure glaucoma, still we are often called upon to hold the process in abatement until an iridectomy can be performed. A two per cent solution of cocaine answers the purpose admirably. It has the advantage over eserine that it relieves pain and lessens the tendency to the formation of synechia.

Discussion: Schmidt-Rimpler had observed a case in which eserine brought on pain and increased the tension.

Schirmer had seen a similar case. Cocaine had given relief.

THIRD SESSION, AUGUST 8TH.

1. Prof. PFLÜGER (Bern): *On parenchymatous keratitis.* P. believes that the causes of parenchymatous keratitis are manifold. All of the infectious troubles which may lead to uveitis may also lead to parenchymatous keratitis. The author mentions three etiological factors of which little mention is made in literature.

I. Agalactia contagiosa, an epidemic disease observed among goats by Hess and Guillebeau, veterinary surgeons in Bern. During the epidemic P. had occasion to see a number of the diseased cattle. The interstitial keratitis seen by him resembled very much that which follows influenza in the human. In the animals, however, there was a peculiar pigmentation of the cornea, and an ulceration, no doubt, of a traumatic character.

II. Pflüger calls attention to the relation of uveitis and paren-

chymatous keratitis to chronic skin lesions. He had seen two cases of psoriasis and one of lichen ruber which had led to parenchymatous keratitis.

III. Author also told of the frequency with which parenchymatous keratitis follows influenza. He had observed it in thirty cases. He distinguishes between three forms.

a. The typical form occurring in old non-syphilitic individuals, which affects one eye, usually involving the iris.

b. A variety closely resembling the form described by Stellwag as k. annularis.

c. A variety complicated with sero-fibrinous iritis in which the exudation covers the entire posterior surface of the cornea, and in which interesting phenomena can be observed in the circulatory system with the aid of large lens.

Discussion: Axenfeld had seen k. parenchymatosa following influenza on three occasions. Hirschberg spoke of the interstitial keratitis occurring in children to whom syphilis had been transmitted by the wet-nurse.

2. Prof. WAGENMANN (Jena): *Remarks on the eye complications in gout.* In the course of time the author has observed a number of eye troubles which he could attribute to existing gout. They consist in a sero-plastic inflammation in which there may or may not be a deposit of uric acid salts. For example, W. cited cases of scleritis, irido-cyclitis with a deposit between the retina and choroid, lumpy deposits in the sclera, and a characteristic case of episcleritis periodica fugax. Gout is also indirectly responsible for eye affections through the production of an early atheromatous condition of the arteries. Recurring opacities in the vitreous, which may finally lead to cataract or detachment of the retina, also come under this category. There may further be certain changes of the cornea characterized by a sclerous condition. There is also some connection between gout and glaucoma.

Discussion: Nieden shared the views of W., and thought that recurring opacities of the vitreous were characteristic of gout.

Pflüger had seen cases of episcleritis fungax, recurring vitreous opacities and glaucoma resulting from gout.

Hirschberg had seen a crystalline deposit in the region of the macula. He also had observed severe recurrent iritis.

Alexander remarked that Snellen had previously shown that the vessels of the eye could become choked up with a deposit of urates.

Horstmann had, in eyes which were otherwise normal, observed

band-like opacities in the cornea. When he sees these opacities he suspects gout.

3. Dr. DARIER (Paris): *The importance of local agents in infectious or sympathetic irido-choroiditis.* D. presented the histories of a number of sympathetic affections where beneficial results had been derived from subconjunctival injections. For two months after the enucleation inunctions and hypodermic injections of cyanide of mercury had been resorted to. This was followed by subconjunctival injections.

When signs of phthises of the other eye were beginning to make their appearance, a hypodermic syringe of cyanide of mercury 1 to 5000 was injected at the equator. At the same time paracentesis of the anterior chamber was made, in this way increasing osmosis. After eight injections V had increased to $\frac{1}{3}$.

4. Prof. WEISS (Mannheim): *The transplantation of conjunctiva to prevent prolapse of iris.* Weiss had with good results covered ulcers of the cornea with a conjunctival flap. This procedure had not only prevented prolapse of the iris, but caused the ulcer to cleanse itself. The conjunctiva healed to the surface without infiltration having taken place. Krüger preferred galvanocaustic treatment of the prolapse.

5. Dr. ALEXANDER (Aachen): *Return of function after embolism of central artery of six years' standing.* A case was reported by A. in which, after the existence of an embolus for six years, the function of the eye had been restored. When the patient, a man of fifty-one, was first seen he presented the typical fundus of an embolism. Under the use of digitalis the V soon rose to $\frac{1}{10}$. It afterwards rose to $\frac{1}{6}$, which remained permanent. Author accounted for the return of vision in this case in a possible partial obstruction of the artery, and that the increased pressure brought about by digitalis forced blood into the partially obstructed vessel.

6. Dr. FUKALA: *A suggestion as to the best way of designating high degrees of myopia and hypermetropia.* High degrees of myopia and hypermetropia are best designated by the number of the lens necessary to convert the rays emanating from the eye into parallel rays, plus the distance of the glass from the eye.

Dr. WOLFF (Berlin): *Advancement of the levat. palpeb. sup. with tenotomy of the tendon.* The method suggested by Wolff is similar to the one introduced by Schweigger for advancement of the recti muscles. The palpebral portion of the muscle is exposed by incision and dissection of the skin. A small fold (about 1 cm.) of

the orbicularis and tendon of the levator palpebral, which is in close apposition to it, are grasped and cut, and the muscle caught up on two squint hooks (Schweigger). The muscle is then advanced as in Schweigger's advancement. The same result could be obtained by attacking the muscle from the conjunctival side. The lid is held in the everted position with a special clamp. The conjunctiva is dissected up, and Müller's muscle, with the levator palp. under it, exposed. The same sized piece is removed in the same manner as in the external method. Wolff recommends the method for all grades of congenital ptosis.

8. Dr. INOUYE (Japan): *A retinal reflex.*

9. Dr. AXENFELD (Marburg): *On the mild and innocent forms of metastatic inflammation, and on thrombosis occurring in both eyes during general sepsis.* The occurrence of internal suppurative inflammations of the eye is positive evidence that pus-generating organisms have entered the interior. It is questionable whether the septic toxine in the blood could become concentrated in the eye and produce inflammation, though it is known that other poisons circulating in the blood can cause mild forms of inflammation in the eye (interstitial optic neuritis following alcohol poisoning). It does not necessarily follow that the deposit of the pyogenic organisms themselves in the eye is always followed by a severe inflammation. The author displayed microscopic sections of a case where the pneumococcus had caused very small areas to undergo pathological changes. The areas were similar to the patches found in disseminated choroiditis.

As small as they were they showed microscopical evidence of inflammation, which differentiated them from non-inflammatory deposits in the retina.

Another condition which is not due to a local deposit of bacteria, but to a general septic condition of the blood, is the formation of venous thrombosis in the retina and choroid of both eyes. This occurs most during the puerperal state.

10. Prof. VOSSIUS (Giessen): *Congenital microphthalmus.* Vossius showed photographs and described microscopical sections of a case in which the cause of the microphthalmus could be demonstrated in inflammatory changes, which had developed during fœtal life. He also accounts for a case of congenital vascular cataract seen by him in this way.

11. Dr. BAHR (Mannheim): Bahr presented a case of congenital periodic exophthalmos.

DEMONSTRATIONS.

Among the demonstrations and presentation of patients and specimens were the following :

Dr. DENIG—(a) Migration of foreign bodies in the anterior chamber of the eye of a rabbit. (b) A new skiascope.

Prof. WEISS—A case in which a large orbital cyst had been operated upon according to Krönlein's method.

Dr. KÖNIGSHÖFER presented a patient who could voluntarily move one eye inwards or outwards while the other eye remained stationary.

Prof. UHTHOFF presented a keratoscope. It was in the form of a semi-circle, whose surface was covered with parallel lines of black and white, which are reflected against the cornea.

Dr. THIER had an eye showing persisting central hyaloid artery.

Prof. LEBER showed specimens of trachoma and demonstrated the "filtration-manometer."

Prof. DIMMER—Demonstrations with a sciopticon. The instrument projected microscopic sections of the eye. To demonstrate the fundus of the eye, Dimmer had used the colored plates of Jaeger's atlas. He had cleared them in xylol and imbedded them as he would a section of tissue.

Dr. WOLFF presented microscopical sections showing the insertion of the levator palpebræ superioris. He also showed how Schweigger's electric ophthalmoscope could, with Knauer's automatic ophthalmoscope, be made to answer the purpose of a skiascope and ophthalmoscope.

Dr. FRANKE presented a patient in whom he had, a year previous, transplanted skin upon the conjunctiva, and which had not changed its character.

Prof. SCHMIDT-RIMPLER spoke of a case which he had reported in 1877, in which atrophy of both optic tracts followed atrophy of the nerve on one side.

Michel and, in recent years, Kölliker maintain that there is a complete decussation of fibres of the optic nerves in the human. Kölliker demonstrated this upon the normal eye. Merkel holds that such an examination is unreliable, that it must be made upon atrophic nerves.

Schmidt-R. demonstrated specimens of the eye of a man who had acquired phthisis of the right eye thirteen years before his death. All of the fibres of the right nerve were atrophic, those

of the left one normal. Atrophic bundles were present in the optic tract on both sides. The atrophy could be followed to the cortex of the brain.

Dr. DARIER reported on the action of an extract prepared from the supra renal capsule. It caused a contraction of the blood-vessels of the eye.

Dr. DOR made a few additional remarks on the treatment of detached retina. The patient must remain in bed, if necessary for months. Heurteloup was applied to temple daily. The sclera was cauterized, at first twice, and later once a week, over the point of detachment. A Paquelin cautery was used.

Prof. HESS (Leipzig) read a paper held over from the session of the day previous, on *the excentric position of the nucleus of the lens, and the histology of lenticonus posterior*. H. demonstrated some cases with drawings and anatomical specimens. He said that lenticonus posterior was often characterized by an excentric (backwards) position of the lens nucleus. At times it is in the lenticonus itself. Hess also showed that in cases of lenticonus the posterior capsule was in early fœtal life torn, at a position between the equator and the posterior pole. The developing lens fibres grew out of the rent and formed a small body resembling the nucleus on the posterior surface of the lens.

REPORT OF THE PROCEEDINGS OF THE "SECTION ON OPHTHALMOLOGY" OF THE "SECOND PAN-AMERICAN MEDICAL CONGRESS."

HELD IN THE CITY OF MEXICO, ON NOVEMBER 16, 17, 18, AND 19, 1896.

PREPARED BY DR. J. SANTOS FERNANDEZ (HAVANA), AND DR. ROB. SATTLER (CINCINNATI).

Translation of the Spanish part by Dr. C. E. FINLAY, Havana.

Monday, November 16th.

Dr. JOSÉ RAMOS, Chairman.

The CHAIRMAN welcomed all present, especially the foreigners who had come from afar to honor Mexican Ophthalmology with their knowledge.

Dr. SANTOS FERNANDEZ, of Havana, read a paper on **Observations of cases of orbital osteo-periostitis.** He made a study of 28 cases of orbital periostitis which he had in his private practice in the course of twenty-one years, in a total of 30,500 eye patients. The number of cases in comparison to that of other eye diseases is relatively less than that found by other observers. He admits the difficulty of an early diagnosis. He considers them as mostly due to lymphatism (scrofula?) or syphilis. Those cases due to the latter cause are readily amenable to treatment. This leads him to insist on the importance of an early clearing up of the etiology. The persistence of inflammatory lesions of the bones of the orbit and their extension to the lids seriously endanger the cornea and may be the cause of loss of sight. These periostites if not exclusively are more frequently met with among the lower classes, who, owing to want of proper

care and attention, not infrequently lose their sight from this cause. In none of Dr. Santos Fernandez's cases was the frontal sinus the origin of the affection, notwithstanding that this is reputed to be the most common cause of this kind of orbital inflammation. He has more often found them due to disease of Highmore's antrum, due in its turn to some affection of the teeth. He has also seen them produced by diseases of the nose. He assigns importance in the treatment, to the use of tents of laminaria digitata, especially in timid patients on account of the relief given, and the shortening of the course through a more prompt elimination of the sequestra when there is caries.

Discussion in Spanish: Taken part in by Drs. Chavez, Chacon, Montaño, and Ramos of Mexico, and by Dr. Sattler of Cincinnati. The former stated that in Mexico the relative proportion of periostites to the number of eye patients was also small. Dr. Ramos has always been an advocate of free incisions with the object of giving exit to the pus and sequestra; he has found syphilitic periostitis very rebellious. Dr. Chavez has had more periostites of the syphilitic variety and has found them very amenable to treatment.

Discussion in English—Dr. SATTLER: "My experience with surgical treatment of caries, necrosis, and periorbitis of the walls or margin of the orbit is a little at variance with that of Dr. Santos Fernandez. The plan of treatment which I follow is to make a free opening, giving access to the seat of the disease, and give exit to pus or remove necrosed or diseased bone. If there is a tendency to retraction of the lids, they are united by inflammatory adhesions and with sutures, and the palpebral fissure temporarily closed, so as to afford protection to the eye and to prevent cicatricial contraction and lagophthalmos. This is a plan that is in my practice, in all extensive and chronic cases, resorted to, and appears to me less tedious and more satisfactory than the lengthy dilatation of the fistulous tract with sponge tents."

Dr. BRYANT, of Omaha, Neb., read, in English, a paper on **Burns of the conjunctiva.** Their treatment, he said, depends on their extent, and he employs two methods, one for the mild and the other for the severe cases. Most of the cases he has seen have been caused by hot metals and were limited in extent; in these, on the elimination of the slough he passes a squint hook under the conjunctiva along the margins of the wound;

loosening the attachments to the eyeball sufficiently to enable them to be brought together. He then sutures them with fine silk. The subsequent treatment is that of any other wound of the conjunctiva. The rapid healing obtained by this method prevents the dreaded result of a union of the palpebral with the ocular conjunctiva. The second method, which he employs where the burned surface is too large to allow of the employment of the first, consists in the use of animal grafts at the proper time, *i. e.*, at the beginning of the second period, not waiting for the third, as formerly advised.

At the request of the president, Dr. Sattler gave first a brief synopsis of Dr. Bryant's paper in French, and Dr. Redmont followed in Spanish.

Dr. SATTLER in opening the discussion (in English): "Dr. Bryant has presented a subject of great practical interest. My experience has not been so favorable with burns of the conjunctiva, with the exception of those cases which involve only the superficial layers. In others, in which the mucosa is destroyed, and in which sphacelation of the entire thickness and even the submucous, episcleral, and scleral tissues results, it has been rather uniformly unsatisfactory. This has been the case, even in spite of careful separation and the interposition of plates of rubber, ivory, transplantation of conjunctiva from mouth and from animals' eyes. Symblepharon in such cases would almost invariably result, which a subsequent operation would only relieve imperfectly and only by an extensive plastic operation or operations.

"I have never had any success with transplantation of conjunctiva either from other mucous surfaces of man or from the eyes of dogs or rabbits."

Dr. BRYANT: "I have tested this method and have found it superior and giving better results than other methods of treatment."

Dr. HENRY REDMONT, of Texas, considers symblephara difficult to avoid in burns of the conjunctiva when these are extensive. In a severe case of his he obtained a relatively satisfactory result, some mobility being restored to the eye, by means of an apparatus, made for him by a dentist, which he slipped between the upper eyelid and the eyeball, afterwards suturing the lids together. There was a good deal of swelling of the lids, but at the end of seven or eight days, when he withdrew his apparatus, he had destroyed most of the adhesions.

Dr. SANTOS FERNANDEZ, of Havana, said that he has observed that the most rebellious symblephara occurred after burns with lime. He recommends the insertion of an artificial eye of enamel or glass, whenever one desires to interpose anything between the lids and eyeball.

The CHAIRMAN opened the discussion on **Prolapse of iris after simple extraction: its etiology and treatment.**

Dr. SANTOS FERNANDEZ states that prolapse of iris, the inefficient cleansing of the anterior chamber, and secondary cataract are the three difficulties to be overcome in simple extraction, even with the help of antisepsis and local anæsthesia. He considers that, notwithstanding the fact that these points have been carefully studied by the authorities in ophthalmology, we are still far from having solved their difficulties. As far as he is concerned, he thinks that he has diminished the proportion of prolapse by the use of the diametral section, finishing this as far in the periphery as possible. He considers that this section, which is an approach to a median keratotomy, offers less difficulty for the removal of the lens, and prevents the prolapse. It does not, however, avert anterior synechiæ—slight because the prolapsed iris never occupies the whole length of the section, generally only its internal angle, and rarely does the adhesion extend beyond a single point.

Dr. VERTIZ, of Mexico, states that both he and his father have for a long time employed a large flap, without reaching the periphery, although without the knowledge that they were thus avoiding a prolapse of iris; the fact is that they have met with the same absence of prolapse as Dr. Santos Fernandez.

Dr. GALINDO, of Fulancingo, Hidalgo, says that although his experience is short, he has obtained similar results with the non-peripheric flap.

Dr. MONTAÑO, of Mexico, attributes the prolapse to repeated pressure with the spoon, which breaks up the small cells in the vitreous near the periphery which push the iris forwards; he advises that the pressure be uniform.

Dr. CHAVEZ drew the operation on the black-board, and tried to prove that a section perpendicular to the surface of the cornea predisposes more towards prolapse than an oblique one.

Dr. RAMOS, in summing up, recognized the difficulty of determining the cause of prolapse of iris, which may at times follow an uncomplicated operation, and not be met with after a difficult one, nor even after accidents during the healing. He next dis-

cusses the treatment, and considering the prolapse as a little dangerous symptom since the discovery of antisepsis, he thinks that one ought to wait for the adhesion of the iris to the wound margins to take place, and then to excise the prolapse.

Dr. CHAVEZ favors immediate excision as a preventive of prolapse; when this occurs he attempts its reduction.

Dr. CHACON denies the efficacy of eserine; on the contrary he believes it favors the formation of secondary cataract.

Monday, November 16th, 3–5 P.M.

Dr. RAMOS, Chairman.

Abstract of Dr. Sattler's paper on **Sarcoma of the orbit.**

Fourteen cases of malignant neoplasm of the orbit form the subject-matter of this contribution. Eight commenced as orbital growths and six took their origin from intra-ocular neoplasms. The conclusions emphasized from the observation of these cases are:

1st. That sarcomatous disease of this locality was inflexible in its course and almost uniformly fatal in its termination.

2d. That in exceptional cases only and when the growth is encapsulated early recognition of the nature of the disease, followed by immediate exenteration of the orbit may bring about its disappearance.

3d. Radical operative treatment is therefore justifiable in these most malignant of neoplasms, only during the early stage and if an exploratory operation discloses an enveloping capsule. In many cases it only seems to excite an increase of activity. It is positively unjustifiable and harmful if practised in the advanced stages of a rapidly growing tumor which has infiltrated the tissues and walls of the orbit.

The real origin here as elsewhere, remains obscure.

The most treacherous neoplasms were those of sub-periosteal origin. These were characterized by an almost incredibly rapid course and without exception resented surgical interference and manifested more malignant and more rapid activity after surgical interference.

More insidious so far as early manifestations are concerned but equally destructive and rapid during their later stages are glio-sarcomata of the globe. Unless speedily recognized and as

speedily removed by enucleation they burst through the tissues of the orbit, infiltrate the other structures of the orbit, etc., and inevitably terminate fatally.

Less rapid in their course but none the less fatal are those which originate in the bones of the skull and adjacent sinuses and by extension infiltrate the cavity.

No time of life was exempt. Childhood and during the early adult periods it was found more frequent.

Five of the cases of glio-sarcoma occurred in children, the sixth, a melano-sarcoma, in a woman aged 60.

In the last case the diagnosis of intraocular sarcoma was followed at once by enucleation. No tumor could be discovered in the orbit, but in five months the entire orbit was filled with a soft, inky looking sarcomatous mass.

In childhood and early life, an exceptionally rapid course was the invariable rule, an average duration of from three (3) to eight (8) months. During advanced life it was more protracted, extending in several cases over a period of several years.

Radical surgical treatment was practised in twelve out of fourteen cases and in every case without delay and in the most thorough manner.

The results bring up the cardinal question: Is radical surgery, exenteration of orbit, resection of bony walls, etc., in a case of rapidly growing sarcoma of the orbit, a justifiable measure? Should these cases be classed with the inoperable ones and receive only palliative treatment?

Certain it is that an exploratory operation can alone decide the advisability of radical operative measures. If this discloses a sub-periosteal neoplasm, a soft infiltrating growth of the connective tissues and globe or an extensive implication of the bony walls, if in addition the duration is brief and the growth rapid, surgery should only be resorted to with a full understanding of its hopelessness and uncertainty.

It should never be practised in a case of general sarcomatous disease in a child in which the orbital lesion is only the most conspicuous local expression of a simultaneous general infection, although enucleation is in most cases a recourse of beneficent expediency. All large and rapidly growing neoplasms of short duration, whether their origin be from the orbital tissues or walls or from an intraocular glio-sarcoma, must be classed among inoperable ones.

Such cases are only converted into more malignant recurrent growths and this is almost an unavoidable sequence of radical surgical treatment. Those most favorable for operation are the capsulated varieties of sarcoma. Unfortunately, however, this is rarely met with. An exploratory operation should in such a case be followed at once by speedy removal of the tumor, if possible, without rupture of its capsule. This, however, is not always possible because of the well-known secondary degeneration of these growths, their pulpy consistence, and owing to the fragility of the enveloping capsule. It should always be supplemented by complete exenteration of the orbit and even the use of the thermo-cautery. It should be the concern of the surgeon to make operative interference as thoroughly as possible in this, the only variety of malignant sarcoma in which a chance to save life is offered.

Discussion: Dr. SANTOS FERNANDEZ, referring to gliomata and sarcomata proceeding from the interior of the eyeball, says that in most of his cases a recurrence of the growth occurred, as he had seldom been able to operate while the tumor was still limited to the eyeball. When they have occupied the whole interior of this organ, not permitting a satisfactory ophthalmoscopic examination, he has found it very difficult to determine whether the case was one of simple detachment of the retina or of a malignant tumor.

Dr. CHAVEZ believes that in the detachment caused by an intra-ocular tumor, one finds a certain vascularization which is absent in that caused by other lesions, including cysticercus, of which he recently had a case.

Dr. RAMOS has made the same observation in a case which he saw in consultation with Dr. Chavez, and also attaches importance to the little mobility of the detached retina pointed out by Dr. Santos Fernandez.

Dr. SATTLER emphasized the conclusions referred to in the paper, and concluded by saying that sarcomatous disease commencing as a sub-periosteal growth is one of the most dangerous neoplasms found in the orbit, and that early adult life and childhood are the two periods of life during which it is most common. It is fortunately a rare disease. Equally dangerous are the glio-sarcomatous growths which start as intra-ocular growths and soon become extra-ocular ones. They also grow with startling rapidity. Only one variety of sarcoma, and that is the encapsulated, offers a chance that surgery may afford relief; all other

varieties are hopeless and singularly fatal, more rapidly so with interference than without.

The CHAIRMAN opened the discussion on the **Etiology and treatment of secondary cataract.**

Dr. SANTOS FERNANDEZ referred to the general interest excited among oculists in making a perfect discission, and in the cleansing of the anterior chamber; but it is a known fact that if there is no opacity of the anterior capsule we may have one of the posterior capsule. Discission is not in the opinion of all surgeons a simple operation, and if made a long time after the extraction, may produce amaurosis probably from glaucoma; but if performed six or seven weeks after the extraction, as is the custom with Knapp, it is really innocent. He does not believe in the extraction of the cataract in its capsule; he at least has given up all procedures which tend to this object.

Dr. VERTIZ describes a method of his own for the extraction of the lens in its capsule: he pierces the cataract with a needle with a thread attached to one end; he pulls this and extracts the lens. He uses another special instrument which he leaves in the anterior chamber during the manipulations with the needle. He employs a triangular knife making a linear section.

Dr. SANTOS FERNANDEZ considers the method complicated and difficult to carry out; it tends to create new instruments and to lengthen the operation, while he believes in their diminution.

Dr. RAMOS, discussing the question of secondary cataract, declares himself opposed to performing discission of the capsule with the Graefe knife whilst making the section in simple extraction; he considers this dangerous, and believes that the discission is not large enough to allow the expulsion of all the soft cortical masses. He thinks that an extraction before the lens is totally opaque gives rise to secondary opacities, but that secondary cataract may occur, no matter what method be selected. He believes that the use of eserine after the extraction favors the formation of secondary cataract.

Dr. CHAVEZ says that to avoid secondary he operates only on mature cataracts; that he cleanses the anterior chamber thoroughly, not by injections, which he disapproves of. He does not believe that the use of eserine has any influence in the production of secondary cataract. He repeats that he only operates on mature cataracts, but that the maturity is not always easy to determine.

Tuesday, November 17th, 9 A.M.–12 Noon.

Dr. RAMOS, Chairman.

Dr. HENRY REDMONT, of Corpus Christi, Tex., demonstrated several **Microscopic preparations of tumors** and other pathological lesions, which excited much interest on the part of the members.

Dr. SANTOS FERNANDEZ read a paper :—**Study of some palpebral autoplasties.** He described fourteen plastic operations performed with the object of restoring either the upper, or the lower lid. Of the three general methods, by sliding, proximal, or by distant flaps from the same or another person (Indian method), he prefers the two first, so far as blepharoplasties are concerned. He admits the advantages of the first, but recognizes at the same time the multiple applications of the second. He considers skin grafts as reserved for very special cases. In order to obtain a satisfactory result, it is indispensable to secure perfect freedom of the margin of the affected lid, and to unite the lid borders before adapting the flap. He favors blepharoplasty in two parts: in the first he frees the adhesions which bind the ectropionized or contracted eyelid, and closes the palpebral fissure; after a few days the flap is applied to the defect produced. As regards the flap, he disregards the indications given in the text-books, of such or such a method to be followed as a general rule, as he considers that the site from which it is taken and its shape must depend on the lesion, and even on the shape of the patient's face. He only recommends a fronto-nasal flap (recognized as the best on account of the greater vascularity of the region) for certain contractions or for ectropion of the internal portion of the lower lid, because any contraction will be upwards and tend to raise the lower lid. He thinks that blepharoplasties are seldom entirely satisfactory from an æsthetic point of view, but the main object is to preserve the eye and avoid the loss of sight.

Dr. URIBE read a paper on **A case of blepharoplasty with application of Thiersch's flaps.**

The session was adjourned.

Tuesday, November 17th, 3–5 P.M.

Dr. RAMOS, Chairman.

Discussion of the papers read in the morning session: Dr. SATTLER in English: "I have been much interested in Dr. Santos Fernandez's second paper on plastic operations, and especially in

his method and the results of his surgical methods. The plan of dividing the operation in all extensive cicatricial deformities of the lids into two parts, the first having for its object the division of the cicatricial contractions and uniting of the lid borders, and the second concerned with bringing about a satisfactory covering of the lid by sliding or twisted flaps or detached flaps from the arm, after the methods of Wolfe and Thiersch, is the one which I follow. This plan is also practised by many surgeons in the United States."

Dr. CHAVEZ considered the blepharoplasties performed in Mexico and the case of Dr. Uribe, in which he assisted. He states that it is seldom performed in his country, because more is demanded from it than one ought to expect. Rarely or never is there much æsthetic gain, but that the protection afforded to the eye not only saves much suffering, but enables one to save sight or what remains of it.

The CHAIRMAN proposed opening a discussion on **The manner of making uniform the numbering, the notation, and the prescription of spherical and cylindrical lenses employed in the correction of ametropia, for the whole American continent.** Drs. CHAVEZ, PREFONTAINE, and BRYANT were commissioned to draw up a report.

Wednesday, November 18th, 9 A.M.–12 Noon.

Dr. RAMOS, Chairman.

A paper by Dr. FRANK S. MILBURY, of Brooklyn, N. Y., **Insufficiencies of the muscles of the eye,** was read at the suggestion of the chairman, Dr. Milbury being absent. He attributes headaches and fatigue on the part of the eyes to heterophoria, deviations of the eyes being only appreciated when they reach the degree of squint. He advises, where heterophoria is suspected, an examination of the eyes to be made with regard to astigmatism; this excluded, or if, when present and corrected, no relief be obtained of the asthenopic symptoms, one ought to look for some insufficiency; if present and if it do not yield to the use of corrective glasses one falls back on a tenotomy of the affected (?) muscle.

Discussion: Dr. CHACON says that it is at times difficult to discover heterophoria, and more so to determine its degree; that he only tenotomizes when other simpler remedies have proved unavailing, viz.: correction of the ametropia, if present; ocular hygiene commencing by giving rest to the tired organ. He says

that in the United States great importance is given to the work of Dr. Stevens.

Dr. PREFONTAINE believes that the study of heterophoria is not complete and that authorities in ophthalmology have met failures in their operations.

Dr. CHAVEZ describes a **New method for enucleation of the eyeball,** in which he makes use of scissors invented by himself. These are curved on their edge, one branch which is probe-pointed is several millimetres longer than the other. He makes a small opening in the conjunctiva close to the cornea, introduces the probe-pointed branch and divides the conjunctiva all around and close to the cornea; he next introduces the same branch under each of the tendons of the recti, cutting them—dividing all the adhesions with another pair of curved scissors; he then introduces his index finger till he touches the optic nerve, which serves as a guide for the scissors which are to divide it; he finally divides the obliqui. Later he enucleated an eye in the hospital according to this method, receiving the praise of those present.

Discussion in English and French. Paper read in Spanish and English.

Dr. SATTLER: "I have always practised the old Bonnet method and I can readily see the advantage of the one new pair of scissors with the curved blunt point and which serves the double purpose of hook and cutting instrument. The only objection I see is the difficulty of guiding and manipulating the hook and scissors with the thumb and fingers. We have had various devices of narrow blunt-pointed scissors."

Wednesday, November 18th, 3–5 P.M.

Dr. SANTOS FERNANDEZ, Chairman.

A voluminous paper of Dr. TEOFILO A. MORET, of Buenos Ayres, Argentine Republic, on **Statistics and clinical notes of the Ophthalmological Department of the Hospital of Clinics,** read by title.

Dr. MONTAÑO makes some observations on **The difficulties in keratoscopic diagnosis occasioned by muscular contraction,** and explains by means of formulæ on the black-board the cause of these difficulties.

Discussion: Dr. CHAVEZ recommends the use of atropine in order to avoid them.

Thursday, November 19th, 9 A.M.–12 Noon.

Dr. SATTLER, Chairman.

Dr. ALONSO, of Mexico, reports an interesting case of **Intra-orbital tumor.** The patient was a middle-aged man, who, without great discomfort on his part, noticed a gradual pushing downward of one of his eyes by a tumor of the superior wall of the orbit; there was scarcely any suffering; the upper lid was swollen and œdematous. An exploratory incision having been made, Dr. Alonso found a cyst of about the size of a hen's egg; having collected the contents, these were examined bacteriologically and found to contain pyogenic germs. After the emptying of the cyst the eye returned to its proper place, but from that moment there was pulsation in the region of the orbit—it proceeded from the cranial contents. A tactile examination made manifest the fact that at the site of the cyst there was a defect in the bony wall of the orbit, the cerebrum being exposed. Under an appropriate treatment the patient continued well, though recovery was not yet complete. Vision had only been slightly affected, due to the stretching of the optic nerve. The ophthalmoscope showed no lesion of the fundus.

Discussion: Drs. RAMOS and SANTOS FERNANDEZ after interrogating Dr. Alonso, on several points, agree in considering the case as most interesting and rare. They cannot explain how a simple cyst, which has scarcely given rise to any discomfort and only caused a little palpebral œdema, could have affected the bony wall to such a degree.

Dr. SANTOS FERNANDEZ read a paper on **Treatment of trachoma by subconjunctival injections of permanganate of potassium in the fornix.** In view of the rebellious character of the countless cases of trachoma treated daily in the eye-clinics, the author adds a new method of treatment for this obstinate affection. As the treatment in general use is that by cauterizations, especially in old patients, for other methods, such as excision of *cul-de-sac*, *brossage*, and expression, to be well carried out, necessitate general anæsthesia, he thought of subconjunctival injections of permanganate of potassium into the oculo-palpebral cul-de-sac. He bases his treatment on the fact that the region of the fornix is the most rich in glands and tissues appropriate for keeping up the granulations, and with them the undiscovered germ of the disease resides. If this region be infiltrated by an

antiseptic liquid, such as permanganate of potassium, the cause is directly attacked and the relief or cure should be more rapid and effective than by other methods. The greatest obstacle was the pain produced by these injections, but this was overcome by preceding the permanganate injection by one of cocaine (1 per cent. solution). Although the number of cases treated are not numerous enough to exclude all doubt as to the efficacy of the treatment of one of the most rebellious of eye diseases, it is large enough to prove that they are exempt from danger, and one can logically understand that their action must be beneficial in all cases even if not absolutely curative.

Discussion: Dr. MONTAÑO has listened with interest to the treatment proposed by Dr. Santos Fernandez, for a disease against which so many methods have been recommended, without even the most modern (brossage included) being able to make sure a perfect cure. He thinks, and the author does not hide the fact, that the number of cases is not sufficient to enable any judgment to be passed on the treatment recommended, but that it is evidently innocuous and that in Mexico there will be plenty of occasion to try it, for although there is not more trachoma than elsewhere, there are enough cases of this disease. Trachoma is frequent enough here (Mexico), notwithstanding that he does not recognize as such the affection which for some time back has been designated by Dr. Carmona y Valle as "exuberant conjunctivitis," by Dr. Ramos as "oxide of iron conjunctivitis," and which later Dr. Chacon has associated with the spring catarrh of Europe, and which other authors consider as simply a scrofulous manifestation. Dr. Montaño recommends in the treatment of pannus applications of iodine in vaseline (1 per cent.).

Dr. URIBE agrees with Dr. Montaño in the advisability of trying the permanganate injections in the treatment of trachoma; but that he considers his statement that trachoma is frequent in the city of Mexico as an error. It is on the contrary rare, as can be vouched by the other specialists who practise there.

Dr. RAMOS supports Dr. Uribe's statements, and believes that if at some former time more cases of trachoma were reported it was due to the considering as such of the "exuberant conjunctivitis" of Carmona y Valle, called formerly by Dr. Vertiz, Sen., "conjunctivitis agavica," believing it to be produced by the plant called "maguey," in the localities where this is cultivated for the manufacture of "pulque." He adds that at the last International

Congress at Berlin, in the discussion of the geography of trachoma, he had stated, as also proved in a paper which he published at the time, that in the city of Mexico, on account of its 2600 metres above the sea-level, trachoma was infrequent.

Dr. CHACON has computed the statistics of the "Hospital de San Andres," and in 14,000 eye patients scarcely 200 cases of trachoma are recorded. He gives importance to the height above the sea-level and to the race-factor in the production of trachoma.

Dr. RAMOS only gives importance to the elevation, for in Mexico one meets several races; and the patients which he has seen are either Spaniards or residents of localities distant from the table-land on which Mexico city is situated.

Dr. GALINDO says that when he practised in a locality of the Republic near the coast, in a short time he saw a number of cases of trachoma, whilst since he has practised in a place the height of which above the sea-level is approximately that of Mexico, he has scarcely met any cases.

Dr. BRYANT, who lives in the Rocky Mountains in the United States, scarcely has seen any cases. He thinks that the permanganate injections should be tried.

Dr. SANTOS FERNANDEZ expresses his opinion that nowhere better than in Mexico can the influence of height above the sea-level on trachoma be demonstrated, for Mexico is a city with a European "cachet," where there exists a higher class, the possessors of refined taste, culture, and of the attributes of opulence; and that at the same time nowhere else does one meet with a lower class belonging mostly to the indigenous race, extremely indolent and careless by nature, notwithstanding the numerous efforts directed towards improving their condition,—and as is well known this social class is the best soil for trachoma.

Dr. REDMONT discusses the cases of granular conjunctivitis observed in the town of Berlin, due to the laborious life and crude climate. He recommends electricity in the treatment of trachoma.

Dr. SATTLER calls attention to the care which should be taken in the differentiation of granular from follicular conjunctivitis.

Dr. RAMOS reads a **Short study of astigmatism in Mexico.** It is generally admitted that astigmatism, be it simple or compound, myopic or hypermetropic or even mixed, is *according to the rule* when the vertical meridian is the most refracting. Thus expressed he regards the idea of astigmatism according

to the rule as erroneous. Theoretical considerations on the human eye on the one hand, and observations in practice on the other, lead him, according to his humble criterion, to alter the classical acceptation. He has given expression to some of his ideas on the subject before the National Academy of Medicine of Mexico. A careful statistical record kept in his private practice and at the Ophthalmological Clinic of the National School of Medicine authorizes him to modify in part the general designation as follows: 1. An astigmatism is *according to the rule* when the vertical meridian (rare occurrence), or some other which is nearer this than the horizontal (more common), is the most refracting. 2. An astigmatism is *against the rule* when the horizontal meridian (rare case), or some other which is nearer it than the vertical (common case), is the most refracting. 3. It is not rare to find cases where the most and least refracting meridians are inclined 45° to the vertical and horizontal. It being impossible to analyze the figures on which these ideas are based in an extract which cannot contain over three hundred words, he will try to prove with facts his assertions, making clear the frequency of anisometropic (?) astigmatism, be it myopic or hypermetropic.

Discussion: Dr. CHAVEZ observes that he has found a variety of astigmatism called by Roux, "bi-oblique astigmatism."

Drs. PREFONTAINE, BRYANT, and CHAVEZ read the following conclusions, which are discussed and accepted, on the **Best means of making uniform the numeration, notation, and prescription of spherical and cylindrical lenses** used in the correction of ametropia, for the whole American continent: 1. The numeration of the lenses shall always be according to the decimal metric system, *i. e.*, in dioptries. 2. In fixing the axis of cylinders the 0° should be placed to the patient's left, and the glass must be considered as seen from behind. 3. Constructors of combined glasses should be advised to always place the cylinder behind the spherical lens. 4. The prescription should be written thus: (*a*) For the spherical glass, one must first note with the letters R E or L E the eye to be corrected, next with the sign + or − the convexity or concavity of the glass, then the letter S and the number of dioptries, followed by the letter D; formula: L E ± S N D. (*b*) For simple cylindrical glasses—the formula of the eye and lens, followed by the abbreviation **ax** and the number of degrees which indicates the inclination of the axis;

formula : L E ± C N D ax g°. (*c*) For combined glasses, one must first put the formula of the spherical glass, then the sign ⌒, and finally the formula of the cylinder : L E ± S N D ⌒ ± C N D ax g°.

Dr. VERTIZ refers again to his method of extraction of cataract in its capsule (expressing himself in English).

Dr. SATTLER (English): "I have been much interested in Dr. Vertiz's novel and ingenious method of cataract extraction. It necessitates, however, a complicated technique and inflicts greater traumatism than the methods ordinarily practised by ophthalmic surgeons entail. This objection, I fear, would prevent its adoption as a substitute even, in certain favorable cases, for other operative procedures at present in favor and upheld by general experience."

After this the meeting adjourned, and farewell remarks were made by the President Dr. Ramos, Dr. Santos Fernandez, and Dr. Chavez.

The President, Dr. Ramos, asked Dr. Sattler to close the session.

Dr. SATTLER, in accepting the honor conferred, said briefly in French :

"To you, Mr. President, and our Mexican and Spanish-American friends, I must express, in the name of my colleagues, our appreciation for the numerous courtesies extended to us. Certainly we have been the recipients of much kindness and uniform attention, and we shall carry with us only the most pleasant and profitable impression of our stay in the city of Mexico.

"So far as the meetings of this section of the Congress are concerned, they assuredly reflect the painstaking labors of our esteemed President, Dr. Ramos, and his colleagues, Drs. Chavez, Montaño, and Chacon. To his and their personal exertions the success of the Ophthalmological Section, with its interesting discussions, must mainly be ascribed.

"Let us all join in the wish that we may meet at the next Congress in Caracas, Venezuela ; and once more permit me to express my appreciation for all the kindness and courtesy extended to us during this pleasant and profitable visit in your city."

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE SECOND QUARTER OF THE YEAR 1896.

By Dr. ST. BERNHEIMER, in Vienna; Prof. C. HORSTMANN, in Berlin; and Dr. P. SILEX, in Berlin;

WITH THE ASSISTANCE OF

Dr. S. M. Burnett, Washington; Dr. Dantone, Rome; Dr. Herrnheiser, Prague; Prof. Hirschmann, Charkow; Dr. P. von Mittelstädt, Metz; Dr. Sulzer, Geneva; Dr. L. Werner, Dublin; Dr. C. H. A. Westhoff, Amsterdam; Dr. Schiötz and Dr. Ole Bull, Christiania; Dr. R. Greeff, Berlin; Dr. Deus, Berlin; and others.

Translated by Dr. Ward A. Holden.

Sections I.–V. Reviewed by Dr. ST. BERNHEIMER.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

TREATISES ON GENERAL, BIBLIOGRAPHICAL, AND HISTORICAL SUBJECTS. STATISTICAL REPORTS.

184. Guaita. Dr. Giovanni Rosmini, *Annal. di Ottalm.*, xxv., 2–3, p. 316.

185. Albertotti. Researches in the history of spectacles. *Accad. di Scienze, Lettere et Arti di Modena.* June 3, 1896.

186. Schenkl. Report on the out-patient eye service of the policlinic of the German University in Prague for 1894. *Prag. Med. Wochenschr.*, 1896, No. 4.

187. Steiner. Report of 3104 cases of eye disease in Malays. *Geneeskundig Tijdschrift von Nederlandsch-Indie*, xxxvi., p. 32.

188. SCHLEICH. The visual power of the higher animals. Introductory address on accepting the professorship of ophthalmology in the Tübingen high school, February 6, 1896.

GUAITA (184) has written a memorial of the ophthalmologist Rosmini, deceased in March, 1896, who was the founder and director of the Milan ophthalmic institute and one of the first of Quaglino's scholars.

ALBERTOTTI (185) says that the statements of Mercurialis and Redi to the effect that Gordonius mentioned spectacles in his works are now confirmed by comparing the passages cited in five different codices of this author. Albertotti, however, cites a passage in the works of Guy de Couliac found in Venetian incunabula and in a palimpsest of the 14th century, from which it appears that Guy de Couliac really saw spectacles and described them.

SCHENKL (186) treated 4140 eye patients in the Prague University clinic in 1894. Conjunctivitis made up 2094 cases, with follicular conjunctivitis 1002. Besides these there were 12 cases of glaucoma, 50 of cataract, 303 of refraction anomalies, and 93 of accommodation anomalies. HERRNHEISER.

According to STEINER (187) thirty per cent. of his cases are trachoma and its sequelæ. Lachrymal-sac diseases are rare among the Javanese.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

189. BASEVI. A contribution to the study of the thermometry and stethoscopy of the eye. *Annal. di Ottalm.*, xxv., 2–3, p. 269.

190. SEGAL. On the haloes seen by healthy and diseased eyes. *Wjest. Ophth.*, 1896, 3.

191. VAN DUYSE and DE BERSAQUES. A congenital sacrococcygeal tumor with a rudimentary ocular vesicle. *Ann. de la Soc. belge de Chirurgie*, 6–15, Oct., 1895.

192. MÜLLER RÉE. Visual tests with a luminous point. p. 147, *Med. LXI.*, *Faaler*, *Det Nordiske Forlag.*, Copenhagen, 1896.

193. SILEX. Pathognomic signs of congenital syphilis. *Berl. klin. Wochenschr.*, 1896, 7.

194. v. REUSS. On the electric treatment of ocular inflammations, *Wiener klin. Wochenschr.*, 1896, 20, p. 393.

195. SALZER. Experimental investigations on spontaneous perforation of the sclero-corneal margin after the introduction of aseptic materials into the anterior chamber. *Graefe's Archiv.*, xl., 2, pp. 55–79

196. BACH. An anatomical contribution to the genesis of congenital coloboma of the eyeball. *Arch. f. Augenheilk.*, xxxii., 4, p. 277.

197. SIMON RICHARD. On a disagreement between the results of the stereoscopic tests and of Hering's test with the falling balls. *Centralbl. f. prakt. Augenheilk.*, xx., June.

198. BAAS, K. The semiotic meaning of pupillary disturbances. *Samml. zwangloser Abhandlungen a. d. Gebiete der Augenheilk.*, vol. i., part 3. Halle, 1896.

199. WEEKS. Lipoma of the interior of the eye. *N. Y. Eye and Ear Infirmary Reports.* Jan., 1896.

BASEVI's (189) measurements of the temperature of the eye show that the action of light, massage, and inflammation cause an increase in temperature. In a case of dacryoadenitis the temperature rose to 39.2°. Atropine, eserine, and some other drugs raise the temperature, while cocaine lowers it. Auscultation of the eye permits the sound of the recti muscles to be differentiated from that of the obliqui. DANTONE.

In a tumor of the coccyx removed from a patient aged three years, VAN DUYSE and DE BERSAQUES (191) found a monolocular cyst lined with pigmented pavement epithelium. The cells were hexagonal like those of the proximal layer of the retina. It probably represented a rudimentary primary optic vesicle without a trace of invagination. Similar cysts have been seen by Kümmel (coccygeal tumor), Baumgarten (ovarian tumor), Verneuil and Guersant (tumor of the testicle). SULZER.

MÜLLER RÉE (192) has made a number of experiments with a luminous point for the purpose of determining whether in this way anything definite can be elicited in regard to errors of refraction. The patient's eye, before which is a lens of 3 D, is placed at distances varying from 1 *cm* to 1 *m* from a point of light, and the patient is required to draw the image of the light as it appears to him at the different distances.

Regularly astigmatic eyes are rare. Usually there are irregularities which the author classes under two heads: (*a*) cases in which planes passing through the pupil and being parallel to one

of the principal meridians are more strongly refracting at one end than at the other, and (*b*) cases in which similar parallel planes are of different refractive strength. There are also eyes whose optic systems form a curved focal line as the image of a luminous point. This method facilitates the discovery of optical anomalies which are not easily made out by other clinical methods, and which being overlooked, an erroneous diagnosis of amblyopia is made. The greatest acuteness of vision found by the author was 6/4 Snellen, which often existed in eyes with regular optical systems, but was once present in an eye which had a very irregular optical system. The determination of astigmatism by means of a luminous point seems to be the most accurate method both for the discovery of the astigmatism and for its measurement.

SCHIÖTZ.

In WEEKS's (199) case the interior of an eye 18 *mm* in its equatorial diameter, which has been diagnosticated as congenital staphyloma of the cornea, was found to be filled with a mass of pure lipomatous tissue. The corneal layers were all present, but the layer of Bowman was supplanted by a thick pannus substance and the endothelial layer was absent in places. There was no lens. The probabilities seem to be that there was primarily an ulceration of the cornea which healed after the escape of the lens with subsequent development of the fatty tissue.

BURNETT.

III.—INSTRUMENTS AND REMEDIES.

200. DE VINCENTIIS. On the so-called new method of making an artificial pupil by means of iritomy "à ciel ouvert." *Lavori della clinica oculista d. R. Univer. de Napoli*, iv., 3, p. 260.

201. UHTHOFF. A contribution to keratoscopy. A new keratoscope. *Zehender's klin. Monatsbl.*, xxxiv., p. 219.

202. BULL, GEORGE. Subjective optometry. *Arch. d'opht.*, xvi., 4, p. 219.

203. MORTON, R. A. Case of hyoscine poisoning following instillation. *Brit. Med. Journ.*, 1896, p. 336.

204. ROGERS, F. T. Acute glaucoma in both eyes following the instillation of homatropine. *Ophth. Record*, May, 1896.

205. BATES, W. H. The use of extract of supra-renal capsule in the eye. *N. Y. Med. Journ.*, May 16, 1896.

206. MAYO, FLORENCE. The comparative values of homatropine and atropine as mydriatics. *Med. News*, Jan. 27, 1896.

207. BURNETT, S. M. The use of formalin in ophthalmic practice. *Ophth. Record*, March, 1896.

208. JACKSON, E. The mirror for skiascopy. *Amer. Journ. of Ophth.*, April, 1896.

DE VINCENTIIS (200) explains that the new method of forming an artificial pupil described by La Grange under the name *iritomie à ciel ouvert*, is new in nothing but the name. He himself described this operation in 1886 as *iritomia ab externa*. Schöler in 1886 also described the same operation, calling it extraocular and, later, precorneal iridotomy. DANTONE.

In the subjective determination of refraction, BULL (202) corrects with the star figure the meridian of least curvature, using the weakest possible concave glass in myopic and the strongest convex glass in hyperopic and mixed astigmatism. Then concave cylinders are added until the astigmatism is corrected. The cylinder is then left in place and other spherical glasses are added until the refractive error is corrected. The author uses two black lines crossing at a right angle on a rotating disc, the lines being placed in the directions of the principal meridians, as revealed by the star figure. Since one only needs to see two lines sharply, the examination with spherical glasses is rendered easier. V. MITTELSTÄDT.

MORTON'S (203) patient, a woman aged fifty, suffered from irido-cyclitis, for which 6 drops of 1 % sol. of atropine were instilled thrice daily with little effect on the pupil, and only caused slight dryness of the throat. A fresh 1 % sol. of hyoscine was made and 2 drops were put into each eye. Five minutes after she complained of giddiness, great dryness of the throat, and staggered. She then became unconscious for four hours, face flushed, pulse full regular; this was succeeded by a period of semi-consciousness and delirium. She recovered after a good sleep. WERNER.

ROGERS' (204) patient was a woman forty-one years old, on whom he had used $\frac{1}{60}$ gr. homat. hydrobrom. and cocaine mur. $\frac{1}{60}$ for testing refraction. Two days later there was a localized œdema of the conj. of the left eye, but no increase of tension. On the next day there was a full-blown glaucoma in the left and commencing in the right. Iridectomy in both, with vision of R 0.2, L 0.6. BURNETT.

BATES (205) has been making experiments in the use of extract of the supra-renal capsule of the sheep, and he gives a preliminary report of its effect on the eye. Its most marked effect when dropped in the eye is to constringe the blood-vessels and render the subconjunctiva anemic. He has found it to do so in all inflammatory conditions of the anterior portion of the eyeball. The effect lasts for about an hour. It acts promptly as a hæmostatic in operations on the conjunctiva. Its use is not painful, and there are no toxic effects. BURNETT.

After a comparative trial of homatropine and atropine as paralyzers of the accommodation, MAYO (206) concludes that atropine fails to reveal any error of refraction which homatropine had not already uncovered. Homatropine was used, 1 gr. to 40 minims of water, one drop every five minutes for an hour before testing. BURNETT.

BURNETT (207) has used a solution of formalin with excellent effect in muco-purulent conjunctiva and "pink eye," also in ulceration of the cornea, touching the ulcer with a 1. to 60 solution once a day and using 1 to 2000 as a wash every four hours. He thinks the great penetrating power of the drug its chief advantage over other anti-microbic remedies.

JACKSON (208) recommends that a mirror for skiascopy should have a small eye hole not above 2 *mm* in diameter. As to the size of the mirror itself he commends one 38 *mm* in diameter, which can, for certain purposes, be advantageously reduced to 10 *mm* by having a cover with an opening of this size that can be slipped over it. BURNETT.

IV.—ANATOMY.

209. PASSERA. The vascular network of the chorio-capillaris in man. *Studies from the laboratory of normal anatomy of the Royal University of Rome*, v., 2.

210. COLLINS, E. T. The glands of the ciliary body: a reply to some recent criticisms concerning them. *Ophth. Review*, xv., p. 67.

PASSERA (209) describes in detail the finer relations of the capillary network of the choroid, illustrating them with twelve fine colored drawings of injected specimens. As new observations he states that the meshes of the network gradually decrease in size toward the posterior pole of the eye and are narrowest at the

macula; further, the terminal branches which, according to Leber, run perpendicular to the plane of the membrane, really do so only near the macula, but toward the ora serrata they have an oblique course. DANTONE.

Collins (210), when speaking of glands, states that he does not refer to the recesses between the ciliary processes but to definite outgrowths of cells from the pigment epithelium only. The fact that Alt could not find a lumen between the cells is probably due to the fact that he did not examine bleached transverse sections. The posterior groups of glands are not, he thinks, due to folding of the epithelium. He does not deny that the aqueous is secreted by the surface as well as by the glands of the ciliary region. Proliferation of the pigment epithelium of the choroid, ciliary body, and iris occurs under similar circumstances, but it is only in the ciliary region that tubular processes come to be formed. The number of cases of primary glandular or carcinomatous-like new growths of the ciliary body is increasing. WERNER.

V.—PHYSIOLOGY.

211. OSIO. Diffusion circles. *Ann. di Ottalm.*, XXV., 2–3, p. 123.

212. MAGNANI. Monocular vision and painting. *Arch. di Ottalm.*, iii., 11–12, p. 333.

213. THOMAS. On the association fibres of the oculo-motor nuclei. *Ann. d'ocul.*, CXV., p. 293.

214. KATZ. On the minimum of illumination possible for work. *Wratsch*, 1896, 18–20.

215. HESS. Studies in accommodation. II. On the partial contraction of the ciliary muscle correcting lenticular astigmatism. *Graefe's Archiv*, xlii., p. 80.

216. ALLEN, S. B. Asthenopia due to glare. *Manhattan Eye and Ear Hospital Reports*, Jan., 1896.

217. DENNETT, WM. S. Shaded glasses. *N. Y. Eye and Ear Hospital Reports*, Jan., 1896.

218. CHASE, W. E. An instrument for the study of color scotomata. *Ibid.*

OSIO's (211) comprehensive paper treats of: 1. The laws according to which diffusion circles arise, with a critical review of the various methods of observation. 2. The computation of the

different diameters of the circles in different eyes and with different states of refraction and accommodation. 3. The disturbance of vision produced by diffusion circles. 4. The practical and mathematical proof of the difference in result between actual observation and computation. 5. The objective proof, by means of photography, of the laws and peculiarities of diffusion circles.

MAGNANI (212) has examined seventeen pictures by Guercino, who squinted with his right eye, in order to find whether the pictures show faults which might be attributed to his monocular vision. The author believes that he has discovered faults in drawing and in coloring which, however, are rather to be attributed to the negligence of a rapid painter. As regards conception of perspective, use of foreshortening and handling of chiaroscuro for the purpose of producing the effect of relief, Guercino had been too thoroughly instructed by the Caracci in Bologna, to go wrong even with his defective vision. In conclusion, the author mentions the fact, that there is at present a scholar in the Turin academy whose drawings are so excellent in every respect that his professors consider him easily the best scholar in the school, they being unaware that he has only monocular vision, one eye being aphakic. DANTONE.

In experiments on the cerebellum and its peduncles, THOMAS (213) twice accomplished the destruction of the abducens nucleus, once in a rabbit and once in a guinea-pig. Both animals lived long enough to permit secondary degeneration to take place. The nucleus of the abducens and its fibres of association could thus be studied in serial sections.

Matthias Duval and Laborde have supposed that the commissural fibres between the abducens nucleus and the oculo-motor nucleus of the opposite side run in the posterior longitudinal bundle, and pass the median line at the point where they enter the oculo-motor nucleus of the opposite side. Thomas found degenerated fibres in the posterior longitudinal bundle of the side opposite the lesion. This fact proves that the crossing of the association fibres takes place at a point lying deeper than Matthias Duval and Laborde supposed. SULZER.

A minimum working illumination of ten-metre candles as proposed by Cohn, seems to KATZ (214) to be a purely arbitrary selection. The curves made by Uhthoff and Karvetzky show a marked increase in acuteness of vision when illumination is increased, but only a slight increase in ability to read continuously.

A series of experiments gave the author an illumination of four meter-candles as usually sufficient for reading without fatigue. With this illumination one obtains 0.7 of the maximum ability to read by daylight. HIRSCHMANN.

HESS (215) denies the existence of partial contraction of the ciliary muscle on the ground of detailed experiments of his own, and the reports of other observers. In the examination of astigmatic individuals, many sources of error have been disregarded. Thus, for example, the ability to read a certain text is taken to indicate an accurate focussing of the eye for this, although in certain circumstances reading is possible even when large diffusion circles exist. The neglecting of the play of the pupil and the varying width of the palpebral fissure has also led to error.

Hess has also sought to show, by experiments on a number of astigmatic patients, that the accepted view that astigmatic patients must focus on a focal line is wrong, and that for best vision the eye is adjusted to a focal circle.

ALLEN (206) relates some cases in which the asthenopic symptoms seemed to be due to excessive brightness of light, and not to refractive troubles. BURNETT.

DENNETT (217) describes a method of obtaining with accuracy any desired intensity for shaded glasses, according to Fechner's formula. He makes ten grades from white paper to printers' ink, and the shade can be obtained by a Maxwell's disk or top extemporized by marking with ink circles or sectors on a visiting card. BURNETT.

CHASE's (218) method of taking the scotoma for a color is to spread a sheet of paper of the color for which there is a scotoma over a sheet marked in concentric circles and sectors like a perimeter chart. The size of the scotoma is found by advancing a small bit of white paper from the periphery until it reaches the edge of the scotoma in all directions, the markings of these points giving the outline of the scotoma, and when the part embraced in this is torn away, the size of the scotoma in degrees is seen on the chart beneath. BURNETT.

Sections VI.–XI. Reviewed by Prof. HORSTMANN.

VI.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

219. FUKALA. The cure of myopia of high degree. p. 192, *Deuticke.* Leipsic and Vienna, 1896.

220. SILVESTRI. The surgical treatment of myopia. *Sett. med. dello Sperimentale*, iv., 20–22.

221. ADELHEIM. A case of extraction of both lenses in progressive myopia. *Wjest. Ophth.*, xiii., 3, p. 213.

222. ASCHER. On the operative treatment of myopia of high degree. *Beitr. z. Augenheilk.*, xxiii., p. 21.

223. SCHÖN. The refraction of myopic eyes before and after extraction of the lens. *Arch. d'opht.*, xvi., 6, p. 344.

224. APPENZELLER. Transient myopia in diabetes mellitus. *Centralbl. f. prakt. Augenheilk.*, 1896, p. 139.

225. ROURE. On bi-oblique astigmatism and its correction. *Arch. d'opht.*, xvi., 4, p. 24.

In the first part of his book FUKALA (219) gives the results of all the published cases of extraction in myopia, and in the second the computation of the optic constants, the axial length of the eye and the size of the images.

SILVESTRI (220) has removed the lens in thirteen cases by discission and subsequent extraction with good results.

DANTONE.

SCHÖN (223) states that the myopic eye, on account of the increased length of its axis, must lose more in refraction by removal of the lens than the emmetropic eye, but that in consequence of the backward displacement of the lens in the myopic eye the loss in refraction is somewhat lessened. v. MITTELSTÄDT.

ROURE (225) designates by the expression "bi-oblique astigmatism" that form in which the principal meridians are not perpendicular to each other. This astigmatism is not irregular and may be corrected by cylindrical glasses with axes not at a right angle, as the author shows by reports of two cases. The axes of the principal meridians were determined by Javal's ophthalmometer. v. MITTELSTÄDT.

VII.—LIDS.

226. REINER. A case of syphilitic tarsitis with fungoid infiltration of the bulbar conjunctiva. *Beitr. z. Augenh.*, xxiii., p. 57.

227. SILVESTRI. On the etiology and treatment of trichiasis. *Settim. med. d. Sperimentale*, l., No. 5.

228. PECHIN. Considerations on the operative treatment of cicatricial entropium by two new procedures. *Arch. d. opht.*, xvi., 5, p. 291.

229. v. SIKLOSY. The results of two plastic operations for epithelioma of the lids and face. *Zehender's klin. Monatsbl. f. Augenh.*, xxxiv., p. 183.

230. FRANKE. On the use of Thiersch grafts in ophthalmology. *Centralbl. f. prakt. Augenh.*, 1896, p. 170.

231. SCOTT, K. Two cases of symblepharon, with remarks on some native Egyptian methods of eye treatment. *Oph. Rev.*, xv., p. 75.

232. KEBER, J. B. Gummata of the eyelids. *Amer. Jour. of Ophth.*, May, 1896.

233. ALT. A case of rhabdo-myoma of the eyelid. *Ibid.*, April, 1896.

234. LAMBERT, W. E. Epithelioma originating in Meibomian gland. *N. Y. Eye and Ear Infirmary Reports*, January, 1896.

In a patient with syphilis, aged thirty, REINER (226) saw a swelling gradually develop in the right upper lid. Palpation showed it to be connected with the tarsus, and it could be felt through the skin as a large body of cartilaginous hardness. Its yellowish color could be seen through the conjunctiva. The skin over the tumor was hyperæmic but movable and the conjunctiva of the lid and ball was red and granular. The condition improved after inunction treatment.

SILVESTRI (227) speaks of the development of trichiasis and entropium, particularly after trachoma. To correct the condition he employs Crampton's procedure with some modifications. The two vertical incisions ½ *cm* long are made as far apart as possible. After eversion of the lid the conjunctiva and tarsus are cut through parallel to the lid margin and near the mouths of the Meibomian glands. After incising the outer skin and freeing the orbicularis muscle, a narrow strip of skin is removed, if the skin is abundant, and the wound immediately closed with sutures. This must be so done that between the two margins of the skin wound the upper margin of the tarsus is included in the suture. The edges of the vertical incisions are united by two oblique sutures. The author states that he has done this operation 114 times without seeing a relapse. DANTONE.

PECHIN (228) speaks of the disadvantages of the customary entropium operations and compares them with the methods of Lagleyze and Panas. He replies to the objections urged by Lagleyze against Panas's operation, viz., the great pain, the severe hemorrhage, the difficult technique, the unpleasant resulting scar, and the uncertainty of the result. He believes that the subject of entropium operation is exhausted and that nothing more can be done than to make slight modifications of the methods already known. v. MITTELSTÄDT.

In SIKLOSY'S (229) patient, a woman of eighteen, an epithelioma involved the outer half of the upper lid, the entire lower lid and the skin of the face. The conjunctiva bulbi was also involved. The ball was enucleated, the orbit eviscerated, and the affected portion of the lids and skin removed, the defect then being covered by means of pedunculated flaps from the forehead and temple. In another case the epithelioma involved the inner third of the upper lid, the entire lower lid, and the skin of the bridge of the nose, and passed into the orbit above the internal rectus, the eye being otherwise unaffected. The tumor was removed with preservation of the ball, and the defect covered by means of pedunculated flaps from the region of the brow.

In a case of total symblepharon after a burn with lime, FRANKE (230) separated the ball from the lid, and transplanted a skin flap from the arm, placing it in such a way that one half of the flap covered the tarsus, and the other half the sclera. The result was satisfactory.

In SCOTT'S (231) cases, the upper lid was adherent to the upper part of the cornea as the result of using a popular remedy. Particulars are given illustrating the ignorant self-maltreatment, and the fatalistic and careless neglect of the eyes which prevails in Egypt. WERNER.

KEBER (232) gives an illustration of gummata occurring on both lids of the eyes in a negro of 39 who had the initial lesion three years ago. There were similar tumors scattered over the body. BURNETT.

ALT (233) describes the character of a tumor of the lid which had all the appearances of a chalazion. It was not painful, and had been increasing in size for six weeks. The tumor was removed, and found to consist almost entirely of muscular fibres, some old and striated, interspersed with younger ones, some not yet past the stage of long spindle cells. There were numerous

round cells between the fibres, and some collections of them in masses at points, particularly near the vessels.

BURNETT.

In the case reported by LAMBERT (234) the tumor of the upper lid was considered at first to be a chalazion, and so treated. The curetting, however, reduced it only slightly in size, and the walls remained thickened and hard. The whole mass was finally enucleated, and it was found by Weeks to be a tumor of an epitheliomatous character, with but a slight tendency to malignancy.

BURNETT.

VIII.—LACHRYMAL APPARATUS.

235. FAGE. Pseudo-diphtheritic bacilli in a case of dacryocystitis. *Soc. d'opht. de Paris*, Jan. 7, 1896.

236. EWETZKI. Actinomycosis of the lachrymal canaliculi. *Arch. d'opht.*, xvi., 4, p. 209.

237. GALEZOWSKI. Exostosis of the nasal duct as a cause of epiphora, and its treatment. *Rec. d'opht.*, 1896, No. 2, p. 166.

238. PICCOLI. Carcinoma of the lachrymal sac. *Lav. d. clinica ocul. d. R. Univ. di Napoli*, iv., 3, p. 256.

239. BASEVI. The leptothrix buccalis and the pyogenic salivary micro-organisms in the affections of the lachrymal canaliculi. *Ann. di Ottalm.*, xxv., 2–3.

In the secretion of an acute dacryo-cystitis following a chronic lachrymal catarrh, FAGE (235) found a bacillus identical with the diphtheria bacillus which, inoculated on man and animals, proved to be innocent. SULZER.

EWETZKI (236) reports a case of actinomyces of the lower canaliculus, with a microscopic description of the fungus removed. He believes that this is the same fungus that has been found in the other cases of leptothrix disease of the canaliculi. The healthy mucosa of the canaliculus furnishes a poor medium for the development of the fungus, hence its slow growth and the benign course of the affection.

V. MITTELSTÄDT.

In scrofulous individuals GALEZOWSKI (237) finds exostosis of the nasal duct a case of stenosis. The exostosis is most frequently found at the lower end of the duct but it may be higher up. In such cases one finds complete closure of the duct without disease of the mucosa or bone and without secretion in the lachrymal sac.

The exostosis prevent the passage of ordinary sounds, but the author obtains good results by the use of conical sounds.

SULZER.

In a case of conjunctivitis of several weeks' duration, BASEVI (239) found the lower canaliculus stopped with a yellowish plug. After splitting the canaliculus a foul-smelling mass was removed containing leptothrix and staphylococci. The history revealed the fact that the patient had been in the habit of moistening the lids with saliva. A short treatment with antiseptics led to complete recovery.

DANTONE.

IX.—MUSCLES AND NERVES.

240. FÖRSTER. On the therapy of squint. Breslau, 1896.

241. PACETTI. On functional paralysis of the ocular muscles. *Il Policlinica*, March, 1896.

242. KUNN. A case of ophthalmoplegia externa. *Wiener klin. Wochenschr.*, 1896, No. 10.

243. ZIMMERMANN, OTTO. On associated lateral paralysis of the ocular muscles with preservation of convergence. *Inaug. Dissert.*, Strasburg, 1896.

244. KRIEG, PAUL. The congenital defects of ocular motility. *Inaug. Dissert.*, Giessen, 1896.

245. REESE, R. C. A case of traumatic paralysis of the cervical sympathetic with oculo-pupillary symptoms following forceps delivery. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1896.

246. EDSALL and DIELER. A case exhibiting bilateral palsy of the superior rectus muscle, the iris and ciliary muscle, with loss of power of convergence. *Annals of Oph. and Otol.*, April, 1896.

247. CRAIG, F. A. Paralysis of the sixth and seventh nerves occurring in a patient with whooping cough. *Brit. Med. Journ.*, June, 1896, p. 1440.

248. AYRES, S. C. Ophthalmoplegia externa complete with preservation of accommodation and activity of the pupils. *Amer. Journ. of Ophth.*, March, 1896.

249. PRICE, G. H. Paresis of accommodation in a young patient following la grippe. *Oph. Record*, April, 1896.

250. VALK. The indications for operating in insufficiency of the ocular muscles. *Ibid.*, May, 1896.

PACETTI (241) calls attention to the various phenomena observed by him in three cases of oculo-motor paralysis. The ptosis disappeared, *i. e.*, the levator began to functionate again, as soon as the healthy eye was covered with the hand, but the ptosis reappeared when the patient was again allowed to fix with the healthy eye. DANTONE.

In a man of twenty-five, otherwise healthy, KUNN (242) observed ocular-muscle paralysis of peculiar variability. Excessive ptosis alternated with slight ptosis ; convergence was at one time abolished, at another time normal ; in downward fixation strabismus alternated with a symmetrical position of the eyes. The influence of fatigue of the ocular muscles on their function was always noticeable. The clinical picture indicated an asthenic ophthalmoplegia.

ZIMMERMANN'S (243) patient, a girl of nineteen, after a cold bath suffered an incomplete paralysis of associated lateral motility of the eyes while the ability to converge was normal.

REESE (245) reports a case of the ocular symptoms, namely, falling of the lid, contraction of the pupil, and sinking of the globe in the orbit, accompanying paralysis of the cervical sympathetic—caused by forceps in an instrumental delivery.

BURNETT.

In the case reported by EDSALL and DIELER (246) a man of fifty-two had a fall on the head four years before, after which various nervous symptoms developed, and among them ocular palsies. His speech is slow, his movement clumsy, and he complains of pain in the occipital region and along the spine ; no disorder of sensation ; reflexes good. V R $\frac{20}{30}$; L p. l., with evidence of a past neuritis. There is complete paralysis of the superior recti of both eyes, with weakness of the interni. External recti and obliques apparently normal, pupils contracted and respond but faintly to any stimuli ; state of A not given.

BURNETT.

CRAIG'S (247) patient a child aged three. No syphilis or tubercle in family. Paralysis of left side of face and left external rectus occurred three weeks after the whooping cough began. One paroxysm of coughing caused epistaxis ; this was the only hemorrhage which occurred. The frontalis and orbicularis oculi were very much weakened, but the eye could be closed. The paralysis was unaltered in nine months. According to Gowers this was a case of infra-nuclear paralysis. If we admit with

Gowers that the structure subserving inward movement of the opposite eye may escape in a lesion of the sixth nucleus, then the lesion may be here. WERNER.

AYRES (240) reports a case of complete bilateral ophthalmoplegia exterior with preservation of power in the iris and ciliary muscle, in a man thirty-eight years of age. The patient states that his maternal grandfather was similarly affected, but his mother told him that he became affected after an attack of scarlet fever at six years of age. Vision is good and he has no asthenopia, and is otherwise perfectly healthy. BURNETT.

In PRICE'S (249) case a young man of eighteen had a very weak accommodation, requiring + 2.50 or + 3 for reading, which seems to be the residuum of a paralysis of several, or all, of the ocular muscles following an attack of la grippe six years before. BURNETT.

In testing for insufficiencies VALK (250) does not use the Maddox rod or any of its equivalents, but relies upon the power of the different muscles to overcome prisms. The relation of the internus to the externus should be 2 or 3 to 1, and he has rarely seen eyes in which the externus could overcome an 8° prism or the internus an 80° prism. The inferior rectus is slightly stronger, normally, than the superior. In operating he uses three methods: 1st, a partial tenotomy, leaving a few central fibres; 2d, a complete tenotomy, very carefully made; and 3d, a shortening of the muscle by taking a tuck in it by means of a cat-gut suture as has been before described by him. BURNETT.

X.—ORBIT AND NEIGHBORING CAVITIES.

251. WOODWARD. Pulsating exophthalmus; rupture of the left carotid in the cavernous sinus (?). Ligation of the carotid and ligation later of the arterial anastomoses of the internal angle of the eye; recovery. *Ann. d'ocul.*, CXV., p. 286.

252. DE BONO. Pulsating exophthalmus from adeno-angioma of the orbit. *Arch. di ottalm.*, iii., 6–8, p. 215.

253. KNAPP. A case of cavernous angioma of the orbit; removed with preservation of the eyeball. *Arch. f. Augenheilk.*, xxxii., p. 271.

254. DE VINCENTIIS. The state of the eye and its adnexa in a patient operated on a year before for a tumor of the optic nerve. *Lav. d. Clin. Ocul. d. R. Univ. di Napoli*, iv., 3, 202.

255. ADELHEIM. A case of bilateral affection of the labyrinth of the ethmoid in the form of the so-called mucocele labyrinthi ethmoidalis. *Wjest. ophth.*, xiii., 3, p. 223.

256. GRUENING. On orbital fistulæ due to ethmoidal disease and their treatment. *N. Y. Eye and Ear Infirmary Reports*, January, 1896.

257. RIDLEY, J. BROOKE. Orbital tumor: thirty years' growth; history of injury (illustrated). *Brit. Med. Jour.*, 1896, p. 292.

258. DOYNE, R. W. Dermoid tumor of the orbit. *Oph. Rev.*, xv., p. 97.

259. JOHNSON, RAYMOND. Traumatic orbital aneurism. *Brit. Med. Journ.*, 1896, p. 276.

In DE BONO'S (252) case of pulsating exophthalmus from orbital tumor, ligation of the carotid brought about some improvement but it was only of short duration. Paralysis followed, and after some months, death. At the autopsy it was found that the tumor had perforated the walls of the orbit and passed into the brain. Histological examination showed it to be an adeno-angioma arising from the lachrymal gland. DANTONE.

KNAPP (253) removed from the right orbit of a man of thirty-nine, an angioma 27 *mm* long, 24 *mm* broad, and 18 *mm* thick. It lay in the medial portion of the orbit. The extirpation was done without injuring the optic nerve or the eyeball.

DE VINCENTIIS (254) reports on the patient from whom he had extirpated a retrobulbar optic-nerve tumor a year before (see these ARCHIVES, 1896, No. 1, p. 161). The fear that the eyeball, which was left in position, would be destroyed in consequence of the division of the ciliary nerves, has not been justified. The ball recovered its sensibility and partially its mobility, but a convergent squint developed which, however, was corrected by operation. DANTONE.

ADELHEIM'S (255) patient, a man of twenty-one, was operated on for the removal of a tumor as large as a walnut, lying above the internal palpebral ligament on the inner wall of the right orbit and causing exophthalmus and diplopia after developing for two or three weeks without pain. The tumor was cystic, and contained a tenacious mucus. The sac adhered to the inner wall of the orbit so firmly that a portion of it remained in spite of curetting, leaving a permanent fistula above the upper lid. Three years later a tumor as large as a hazel-nut appeared in the left orbit,

which after the use of hot applications and a pressure bandage disappeared, according to the patient's statement. Four months later it reappeared and became red, painful and œdematous. Exophthalmus upward and outward, and diplopia. The tumor was hard and was as large as a walnut. The patient had fever and evening chills, and complained that the nose was stopped. The middle turbinate was found to be swollen, with hyperæmia and œdema of the nasal mucosa and muco-purulent discharge. The author made a diagnosis of mucocele of the ethmoid cells, which had passed on to suppuration after accidental infection from the nose. The tumor was removed, an opening being made in the inner wall of the orbit leading into the ethmoid cells which were filled with pus. These were scraped out and a T-formed drainage tube was introduced with one tube lying in the nose. The patient recovered completely. HIRSCHMANN.

GRUENING (256) reports two cases of fistula of the orbit just above the internal canthal ligament due to disease of the ethmoid, which were cured by forcing an opening through the base by means of a strong probe into the nasal cavity, thus facilitating drainage through the nose. BURNETT.

RIDLEY'S (257) patient, a man æt. forty-six, got a black eye from a blow thirty years ago. A year after sight began to fail and eye to protrude. At present there is a displacement down and out, with limitation of movement; firm, elastic tumor at inner angle; free edge of orbit intact; occasional headache; optic atrophy, tortuous veins; no enlarged glands or involvement of neighboring cavities; no bruise, etc. WERNER.

DOYNE'S (258) patient began to notice protrusion of the eye three weeks previous to his visit, no diplopia, limitation of outward movement. A hard edge of something in position of lachrymal gland was felt. It proved to be a cyst filled with atheromatous material. The outer wall of the orbit was absent, and no bony limit could be felt behind. The parts contracted very well after operation. WERNER.

The patient, a woman æt. forty-four, was shown by JOHNSON (259) at the Clinical Society, London. She fell on her back, was unconscious seven hours, then vomited and at once noticed blood-shot appearance and swelling of left eye. A buzzing noise came on the next day; no venous congestion; no pulsation; loud arterio-venous murmur; fundus normal; paralysis of sixth nerve. I have had a case exactly similar in a man, which was

cured by a ligature of the left common carotid. There was a history of a not very severe fall, which was followed by protrusion of the eye, with almost complete immobility, no venous distension or swelling, fundus normal, no pulsation, but loud murmur all over head and over malar bones, with very well marked systolic reinforcements. Murmur arrested by compressing carotid on same side. Patient recovered completely in a week's time after ligature of common carotid. Mobility of eye completely restored.

WERNER.

XI.—CONJUNCTIVA, CORNEA, SCLERA, AND ANTERIOR CHAMBER.

260. COHN, H. On the extent and prevention of ophthalmia neonatorum in Germany, Austria, Holland, and Switzerland. Berlin, 1896. O. Coblentz.

261. HOSCH. Credé's prophylactic measure. *Jahresber. d. allg. Poliklinik des Cantons Basel-Land*, 1896.

262. WOLFFBERG. Rules for preventing ophthalmia neonatorum and for preventing its extension. 3d edition. Breslau, 1896.

263. KNIES, M. Gonorrhoic conjunctivitis and its treatment. *Samml. zwangloser Abhandl. aus dem Gebiete der Augenheilk.*, edited by Vossius, i., part 5.

264. HOOR. Kalt's irrigation treatment for blennorrhœa. *Centralbl. f. prakt. Augenheilk.*, 1896, p. 233.

265. SAMEH. Pseudo-membranous conjunctivitis and its clinical forms in Egypt. *Rec. d'opht.*, xviii., 1, p. 15.

266. COPPEZ. Ocular diphtheria without false membranes. *Rev. génér. d'opht.*, 1896, p. 51.

267. RIPAULD. A case of diphtheria of the conjunctiva and lids treated with antitoxin. *Annal. d. maladies de l'oreille et du larynx.*, 1896, p. 138.

268. TAILOR. Pseudo-diphtheritic conjunctivitis. *Lav. della clin. Ocul. d. R. Univ. di Napoli*, iv., 3, p. 273.

269. GREEFF. Antitoxin in ocular diphtheria and in post-diphtheritic paralysis of the ocular muscles. Sammelbericht. *Deutsche med. Wochenschr.*, 1896, No. 37.

270. EWETZKY. On diphtheritic conjunctivitis and its treatment with antitoxin. *Berliner klin. Wochenschr.*, 1896, No. 31.

271. SUBAW. Summer catarrh of the conjunctiva in middle Asia. *Wratsch*, 1896, Nos. 17, 18, and 20.

272. PROPOPENKOW. The treatment of trachomatous pannus. *Wjest. Ophth.*, 1896, No. 2.

273. MALGAT. Trachomatous immunity. Monocular trachoma. *Rec. d'opht.*, 1896, 1, p. 9.

274. BASEVI. On the surgical treatment of granular ophthalmia. *Annal. di Ottalm.*, XXV., 2, 3, p. 275.

275. SÄHN. Trachoma in Schleswig-Holstein. *Inaug. Dissert.*, Kiel, 1896.

276. GASPARINI. Bacteriology of acute conjunctivitis. *Annal. di Ottalm.*, XXV., 1, p. 13.

277. DE WECKER. Scraping the cornea for pterygium and ribbon-shaped keratitis. *Soc. d'opht. de Paris*, Jan. 7, 1897.

278. AVEINI. Observations on granulomata of the conjunctiva from foreign bodies. *Arch. di Ottalm.*, iii., 7, 8, p. 208.

279. NUYTS. A case of traumatic transplantation of lashes into the conjunctiva. *Rec. d'opht.*, 1896, No. 5, p. 276.

280. HOOR. A successful attempt to prevent the re-attachment of the surfaces of the wound after symblepharon operations. *Wiener med. Wochenschr.*, 1895, No. 35.

281. WEEKS. Papilloma of the conjunctiva and cornea. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1896.

282. HERRON. Ophthalmia neonatorum in utero, resulting in ulceration and perforation of cornea of right eye before birth. *Oph. Rec.*, April, 1896.

283. COE. A new method of treating pterygium. *Annals of Oph. and Otol.*, April, 1896.

COHN (260) gives the number of persons blind from blennorrhœa in the institutions for the blind in Germany, Austria, Holland, and Switzerland. The German, Austrian, and Swiss institutions have on an average 20 %, the Dutch 13 %. In the German institutions 20 % are under ten years of age, in the Austrian 23 %, in the Swiss 31 %, and in the Dutch all are under 10. Blennorrhœa was found 1938 times among 302,971 patients. Of 710 children with blennorrhœa, 506 were discharged cured, and 141 suffered permanent damage to sight. Gonococci were found 293 times among 498 cases. Thirty-nine mothers had previously had children with blennorrhœa. Cohn recommends Credé's procedure.

Hosch (261) reports on the outbreak of a typical blennorrhœa neonatorum in spite of the use of Credé's method. He believes that it suffices to recommend to mothers and midwives extreme cleanliness and the washing out of the infant's eyes with an indifferent fluid such as boric acid solution.

Knies (263) states that ophthalmia neonatorum is not always caused by the gonococcus. As treatment he uses ½ % sulphate of zinc or 2 % silver solution, and as a preventive measure he recommends Credé's procedure. The prognosis is worse in blennorrhœa of older individuals. He recommends a continued hot bath of 40° C., since a continued body temperature of 40° causes the gonococci to disappear.

Hoor (264) does not use excessive irrigations with a weak solution of permanganate of potash as recommended by Kalt, but he washes out the conjunctival sac with bits of cotton dipped in the solution.

Following Sourdille, Aubineau, and others, Coppez (266) describes a diphtheritic conjunctivitis without pseudo-membranes, and he reports two new case-histories of this sort. If antitoxin is used while a diphtheritic conjunctivitis is limited to one eye, there will be only a slight pseudo-membrane or merely a catarrhal conjunctivitis in the second eye, the antitoxin acting as a prophylactic. Sulzer.

Tailor (268) describes a peculiar pseudo-form of diphtheria in which the affected part is not swollen, nor does it show a membrane or a special discharge, but it becomes necrotic and sloughs off, leaving an ulcerated surface. Investigation showed that the disease depended upon a bacillus which differed considerably from the Löffler bacillus and which the author regards as a variety of the bacterium coli. Dantone.

According to Subaw (271) a peculiar inflammation of the conjunctiva appears annually in the region between Uzun-Ada and Samarcand, and, according to others, in the whole of middle Asia. The epidemic begins in June, is most intense in July, and disappears about the end of November. Although it occurs in the period of greatest heat, it seems not to be dependent upon this. In the summer the weather is excessively warm and there is much dust. In the winter, eye diseases form only 3 % of all diseases, but in the summer 22 %. The affection manifests itself by hyperæmia of the conjunctiva, usually of one eye only, and lachrymation, followed in some hours by œdema of the lids

and chemosis of the conjunctiva. The secretion is slight. The patient complains of itching and pain. The conjunctiva remains smooth and but little infiltrated. On the third day the pain and swelling decrease, and the secretion becomes purulent. The inflammation disappears without a trace on the seventh or eighth day. The disease is very contagious. The author found in the secretion, both free and in the epithelial cells, small bacilli, some uniformly stained, others showing regular constrictions up to the number of four. The ends of the bacilli are not rounded. Culture experiments were not successful. The author believes that these bacilli cause the disease and that this inflammation corresponds to Koch's milder form of Egyptian ophthalmia.

In pannus, PROPOPENKOW (272) cauterizes the cornea with the sulphate of copper stick except when ulcers are present, and he gets good results from this treatment. HIRSCHMANN.

In Nice, where trachoma is not rare, MALGAT (273) has had under observation a number of families in which only one or a few members of each have had trachoma, notwithstanding the constant association with the affected members who have usually been scrofulous or debilitated. The author therefore concludes that the healthy members of the family are immune, and since unilateral trachoma occurs, certain cases must be considered non-contagious. SULZER.

In nine obstinate cases of trachoma that did not yield to the sublimate treatment, BASEVI (274) made a number of incisions in the affected tissue and scraped it with a sharp spoon. In the chronic and hypertrophic forms and particularly when there are corneal complications, the author scarifies and uses nitrate of silver, although he recognizes that this procedure often leads to unpleasant cicatrization. DANTONE.

GASPARINI (276) states that of the purulent inflammations of the conjunctiva, blennorrhœa excepted, that are due to pyogenic microbes or to Weeks's bacillus, there is a fourth form clinically similar to the last, but caused by the Fraenkel diplococcus. This appears in children in an acute form, and in adults in a chronic. The author reports a series of observations in which bacteriological examination left no doubt of the causative microbe being the diplococcus. DANTONE.

DE WECKER (277) in operating on pterygium, simply scrapes off the growth, following this with antiseptic irrigations. In this way he obtains, without any plastic operation, the cure of small

and moderate-sized pterygia, and a very satisfactory clearing up of the opaque portion of the cornea. This simple operation is specially adapted to fresh cases of pterygium, and it also gives good results in ribbon-shaped keratitis. SULZER.

The cases of implantation of cilia in the anterior chamber are much more frequent than those of implantation in the conjunctiva. NUYTS (279) adds a second case to the only one of the latter previously reported. The trauma was caused by a stick striking the eye below the cornea and carrying into the conjunctiva a number of lashes, which soon caused marked irritation.

SULZER.

After the operative separation of a symblepharon, HOOR (280) laid, between the lid and ball, a piece of the membrane lining the shell of a hen's egg, which was replaced by a fresh piece each day. In the course of three weeks there was perfect cicatrization without a new symblepharon.

WEEKS (281) gives the histories and histological characteristics of 3 cases of papilloma of the conjunctiva, which also involved the cornea, which he had himself observed, and brief abstracts of several others which are found in ophthalmic literature. Those tumors show a great disposition to recur, but are not malignant. The growth does not involve the normal structure beneath the epithelium. If a thorough removal is effected, the cornea may remain transparent. BURNETT.

HERRON (282) reports a case of opacity of the centre and perforation of right cornea, with prolapse of iris, in an infant two weeks old. There was at that time but little swelling of the lids, and there had not been any discharge of matter since the birth of the child. BURNETT.

COE (283) treats pterygium by touching the apex with a platinum probe heated to redness. This causes, he says, the vessels of the mass to shrivel up and disappear. BURNETT.

284. DE VINCENTIIS. Ulcer of the cornea from colloid degeneration. *Lavori della Clinica Ocul. d. R. Univ. di Napoli*, iv., 3, p. 305.

285. LODATO. Hypodermic injections of metallic iodine in parenchymatous keratitis. *Arch. di Ottalm.*, iii, 7, 8, p. 243, and *Boll. d'Ocul.*, xviii., 1, p. 5.

286. UOTA. On superficial keratitis of slow course and its treatment. *Il Policlinico*, 1896, Jan. 1.

287. GALLENGA. Brief observations on dendritic keratitis. *Ann. di Ottalm.*, XXV., 2–3, p. 224.

288. HIRSCHBERG. On the new-formed vessels of the cornea and their diagnostic significance. *Deutsch. med. Wochenschr.*, 1896.

289. HIRSCHBERG. Hemorrhage into the cornea. *Centralbl. f. prakt. Augenheilk.*, 1896, p. 177.

290. Dor. Contribution to the clinical study of effusions of blood into the cornea. *La clinique de Bruxelles*, 1895, No. 34–37.

291. FALTA. On opacity of the cornea, and massage. *Pester med.-chirurg. Presse*, 1896, No. 25.

292. GALLENGA. Corneal fibroma, and especially fibroma arising from a cicatrix. *Arch. di Ottalm.*, iii., 9–10, p. 269.

293. FOOTE, C. J. Bacteriology of the normal conjunctiva. *Med. Record*, May 30, 1896.

294. LEWIS, F. N. Jequirity in the treatment of pannus. *Manhattan Eye and Ear Hospital Reports*, Jan., 1896.

295. HULEN, V. H. A report of cases of extensive wounds of the globe. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1896.

296. WOOD, CASEY A. A case of pigmentation of the cornea. *Annals of Ophth. and Otol.*, April, 1896.

297. COOVER, D. H. Peritomy in severe forms of episcleritis. *Oph. Record*, May, 1896.

DE VINCENTIIS (284) gives a detailed clinical and histological description of colloid degeneration of one portion of the cornea and an ulcer that developed in it. DANTONE.

LODATO (285) reports two cases of parenchymatous keratitis of scrofulous origin, in which injections of iodine 1., potas. iodid. 10., and water 100. every second day led to a speedy recovery. Ten or fifteen injections caused the cessation of the symptoms of irritation and produced a clearing up of the cornea. When the keratitis is of syphilitic origin the treatment is without effect. Since the injections are painful the point should be anæsthetized with ether. DANTONE.

In obstinate corneal inflammations UOTA (286) has used subcutaneous iodine injections with success. DANTONE.

GALLENGA (287) has seen two cases of dendritic keratitis in men aged about forty within six months. In both, the narrow

stripe passed beyond the centre of the cornea, but did not reach the opposite margin. Subconjunctival injections were successfully used. In the detritus of the ulcer some microbes were found, but cultures remained sterile. The author also speaks of Horner's herpes cornealis febrilis, which he has seen in 0.39 per cent. of his patients. DANTONE.

After an historical introduction HIRSCHBERG (288) describes interstitial keratitis. This diffuse inflammation, usually due to hereditary syphilis, always causes the new formation of vessels, which never entirely disappear. They mostly lie deep in the tissues, where they branch like birch twigs, and some few are superficial. The corneal changes in ocular tuberculosis and scrofula have an entirely different course. In sclerosing marginal keratitis the vessel formation is limited to the periphery of the cornea, and bundles of thick vessels are seen lying among the cloudy patches in the cornea. The deeper ulcers of the cornea heal with the new formation of vessels which run from the corneal margin to the floor of the ulcer. Trachomatous pannus consists of a superficial vascular network, and in phlyctenular pannus the vessels are similar. In all cases the vessels remain during the patient's whole life, and even years after the inflammation, may furnish a clew to the nature of the original disease.

In a boy of ten, who had received a blow, HIRSCHBERG (289) found a hemorrhage throughout the entire parenchyma of the cornea, hyphæma, and a rupture of the iris. The blood was absorbed after a considerable time, and some years later the vision was relatively good.

FALTA (291) recommends massage for clearing up the opacities of the cornea remaining after inflammations. Since the physiological nutrition in the periphery of the cornea is better than in the centre, the prognosis is better in the case of peripheric opacities. The massage is done through the upper lid with a piece of cloth, the other eye being kept open in order to control the motions of the eye. HERRNHEISER.

GALLENGA (292) gives a detailed histological description of a fibroma which was removed from the cornea of a child of two, after a partial corneal staphyloma had been removed a year before. The author compares his case with several previously reported and suggests that such tumors be called cicatrix fibromas, since this designation most clearly expresses the nature of the disease.

FOOTE (293) in his examination has found many kinds of bacteria—mostly innocuous—on the normal conjunctiva, but often there are no bacteria at all. Washing the conjunctiva cannot be *depended* upon as a means of sterilization. Aseptic dressing applied over the normal eye after twenty-four hours shows growth of bacteria. BURNETT.

LEWIS (294) uses jequirity still in the treatment of the pannus of trachoma and finds it useful and with care not dangerous. He uses the powder, dusted on the conjunctiva, and not the infusion. BURNETT.

HULEN (295) reports thirteen cases of injury to the globe, principally ruptures of the sclera and cornea, in which efforts were made to save the ball. Most were successful. Two had to be enucleated subsequently. BURNETT.

WOOD'S (296) case of pigmentation of the cornea was in a man of fifty-six years who had glaucoma and on whom an iridectomy was made. The pigmentation came on after the operation, during which there was bleeding in the anterior chamber. The author thinks the pigmentation is due to the coloring matter of the blood. BURNETT.

COOVER (297) gives the histories of two cases of episcleritis which he treated by means of a peritomy, denuding the sclera for 5 *mm* back from the corneal edge. BURNETT.

Sections XII.–XXI. Reviewed by Dr. SILEX.

XII.—IRIS.

298. MASSANT. Experimental investigations on the course of the fibres for the pupillary reflex. *Arch. f. Psych. u. Nervenkrankheiten*, xxviii.

299. CASPAR. A case of unilateral reflex iridoplegia. *Arch. f. Augenheilk.*, xxvii., p. 291.

300. BARDELLI. On the etiology of the iritis following streptococcus conjunctivitis. *Ann. di Ottalm.*, xxv., 1, p. 57.

301. BACCHI. Therapy of prolapse of the iris. *Ibid.*, p. 3.

302. GALLENGA. On gumma of the ciliary body. *Annal. di Ottalm.*, xxv., 2–3, p. 210.

303. WERTHER. On sarcoma of the iris. *Arch. f. Augenheilk.*, xxxii., p. 297.

304. FOSTER, M. L. Irido-dialysis. *Manhattan Eye and Ear Hospital Reports*, Jan., 1896.

305. WESTPHAL. A case of multiple ruptures of the iris between the pupillary and ciliary margins. *Zehender's klin. Monatsbl.*, xxxiv., p. 201.

MASSANT (298) in his paper reviews the opinions of various authors on the course of the fibres for the pupillary reflex, and then passes to his own investigations made with the Marchi stain on eleven rabbits from which he had removed the iris. His results in the main corroborate those of other investigators. He finds that the pupillary fibres run in the optic nerve and tract, and thence pass to the inner portion of the stratum zonale and to the upper white layers of the corpora quadrigemina. From the stratum zonale the pupillary fibres pass through the lower segment of the posterior commissure to enter the oculo-motor nucleus.

In a patient of thirty-eight CASPAR (299) found the left pupil unresponsive to light and consensually, but reacting in accommodation. In explaining this phenomenon he follows Heddæus, who believes that there is an affection of the centrifugal fibres from the oculo-motor nucleus, at some point central to the union of these fibres with a supposed accessory bundle of fibres from the accommodation nucleus.

BARDELLI'S (300) experiments on rabbits with streptococcus toxines led to the following results: 1. A subconjunctival injection caused a muco-purulent conjunctivitis lasting four to six days. 2. An injection into the anterior chamber caused a serous or plastic iritis which soon passed off. 3. Repeated instillations into the conjunctival sac caused first a marked conjunctivitis and later keratitis and iritis. The inflammatory processes soon ceased when the instillations were left off. It is questionable whether the results would be the same in the human eye.

DANTONE.

BACCHI (301) does not advise cutting off a prolapsed iris externally, since other portions of the iris then prolapse, but he recommends loosening the iris from the anterior chamber with a curved spongiotome after a small opening has been made with a narrow lance knife for the passage of the other instrument. The author has frequently operated on rabbits with an artificially produced prolapse and has also done it on men with good results. A necessary condition for the success of the operation is that the iris be no longer movable between the margins of the ulcer.

DANTONE.

GALLENGA (302) describes two cases of syphilitic gumma of the ciliary body. In both cases the tumor passed through the iris angle into the anterior chamber and invaded the iris, which was also the seat of the usual condylomata. In one case there was a perforation of the sclera and conjunctiva through which the most of the broken-down tumor mass was evacuated. Under treatment the results in both cases were good. DANTONE.

Fuchs in his monograph on sarcoma of the uveal tract records 16 cases of sarcoma of the iris out of a total of 259. Since then 23 new cases have been seen, and WERTHER (303) now adds two fresh cases, both of pigmented spindle-celled sarcoma. He favors enucleation, since many cases apparently cured by iridectomy come later to enucleation, and the danger of metastasis is greater. In his cases, when examined clinically, iridectomy seemed to be indicated, but the microscopic examination showed that it would have been impossible to have removed the tumor thoroughly in this way.

In some cases of anterior synechia FOSTER (304) has divided the connected part of the iris by means of the sickel-knife needle of Weeks, which possesses many advantages over the straight Graefe knife for the purpose. He suggests the name of iridolysis as appropriate to such a section of the iris. BURNETT.

In WESTPHAL'S (305) case the ruptures were due to the action of a blunt force.

XIII.—CHOROID.

306. STRZEMINSKI. Essential phthisis bulbi. *Rec. d'opht.*, 1896, p. 206.

307. GOLLER. A case of bilateral metastatic panophthalmitis following sepsis, without a fatal result. *Inaug. Dissert.*, Würzburg, 1893.

308. DUNN, JOHN. A case of binocular extra-papillary coloboma. *Virginia Med. Semi-Monthly*, June 12, 1896.

Under the name essential phthisis bulbi STRZEMINSKI (306) describes the case of a man of twenty-two who complained of secretion of mucus and diminution of sight in the right eye and also of circumorbital pain. The eye was lessened in all its dimensions ; there was enophthalmus and slight ptosis, and tension was reduced. The eye was not inflamed, but the cornea was slightly cloudy. The sensibility of the cornea and conjunctiva

was diminished and pressure on the ciliary body was somewhat painful. The skin of the right lids and right side of the face was reddened. Bromide of potassium and morphine injections were used, and nine days later the intra-ocular tension began to increase, and four days later the eye again became normal. A month later a similar attack came on lasting eleven days.

SULZER.

DUNN (308) figures a case of binocular extra-papillary coloboma of the choroid in which retinal vessels—on one side both vein and artery and on the other an artery—crossed the coloboma. There was good central vision in both. There was no scotoma for white, showing that the retina was not involved in the process.

BURNETT.

XIV.—GLAUCOMA.

309. PERGENS. On adenoma of the ciliary body as a cause of glaucoma. *Arch. f. Augenheilk.*, xxxii., p. 293.

310. SIMON. On peripheric scotoma in glaucoma. *Centralbl. f. prakt. Augenheilk.*, xxii., p. 103.

311. SGROSSO. A clinical contribution to the treatment of glaucoma by incision of the tissues of the iris angle. *Lav. della clinica ocul. d. R. Univ. di Napoli*, iv., 3, p. 227.

312. TAILOR. On incision of the tissues of the iris angle. *Ibid.*, p. 197.

313. HAHNLOSER. The results of the treatment of glaucoma in the Zurich clinic in the years 1865–95. *Inaug. Dissert.*, Zurich, 1896.

314. TORNABENE. A case of hemorrhagic glaucoma consecutive to thrombosis of the central vein of the retina. *Arch. di Ottalm.*, iii., 9–10, p. 300.

315. BERGMEISTER. A case of hydrophthalmus cured by iridectomy. *Wiener klin. Wochenschr.*, No. 18.

SIMON (310) calls attention to the fact that besides the central and paracentral scotomata that have been described in glaucoma, there are also found peripheric scotomata, absolute or relative, which may be of diagnostic and prognostic value. The determination of these scotomata, which is best done with paper quadrants 1.5–5 *mm* in size, requires a certain amount of intelligence and attention on the part of the patient. These scotomata in the beginning have always a curved form.

SGROSSO (311) reports on cases of glaucoma in which he has incised the iris angle. Eleven cases were glaucoma simplex, 2 chronic glaucoma with symptoms of irritation, and 2 glaucoma in children with beginning buphthalmus. The tension was quickly diminished in all and the vision improved. In one case there was a relapse a month later. DANTONE.

TAILOR (312) again discusses the incision of the iris angle as recommended by De Vincentiis for reducing intra-ocular tension. The operation has already been done in 62 cases of glaucoma of various forms and the results are more than satisfactory. DANTONE.

HAHNLOSER (313) reports on 50 cases of inflammatory glaucoma and 47 cases of glaucoma simplex. The patients were kept under observation for years. The medicamentous treatment gave the poorest results, sclerotomy better results, and iridectomy the best. Sclerotomy is often useful when iridectomy has been unsuccessful.

TORNABENE (314) observed a case of hemorrhagic glaucoma in an eye blind for ten months from thrombosis of the central vein and hemorrhages into the retina. The author reviews the opinions on the origin of thrombosis, not doubting a connection between this and glaucoma, since thrombosis of the veins, congestion and alterations in the vessel wall are frequently found in glaucoma, but he thinks a satisfactory explanation of the connection has not yet been given. DANTONE.

BERGMEISTER (315) presented a boy of thirteen on whom he had done a successful iridectomy at the age of six months for infantile glaucoma (increased tension, diffuse opacity of the cornea, moderate enlargement of the ball, etc.). There was now a normal anterior chamber, no excavation of the disc, and the ability to count fingers near by, the patient having had strabismus since infancy. Worthy of note in this case was an opacity of the equator of the lens in the coloboma, which Bergmeister believed to be due to the contact of the infantile lens with the operation wound.

XVII.—LENS.

316. GRADENIGO. On capsulo-lenticular extraction of cataract. *Ann. di Ottalm.*, XXV., 1, p. 77.

317. BOGGI. A case of spontaneous complete luxation of the lens. Reduction by massage. *Ibid.*, p. 7.

318. RENNSCHEWITSCH. On glaucoma after cataract extraction. *Zehender's klin. Monatsbl.*, xxxiv., p. 191. (Two cases after extraction, not cured ; one after discission of secondary cataract, cured by iridectomy. H. K.)

319. TAYLOR, C. BELL. The accidents of lens extraction. (Nothing new.) *The Lancet*, 1896, p. 158.

320. TREFONTAINE, L. A. Summary of operations for cataract, done at the New York Eye and Ear Infirmary from October, 1894, to October, 1895. *Eye and Ear Infirmary Reports*, Jan., 1896.

GRADENIGO (316) has again taken up the extraction of cataract in the capsule. After the section he endeavors to rupture the zonula in its entire extent by means of a hook like a squint hook, and he then presses out the cataract, using a ring-shaped spoon. Of the 25 cases so operated the manœuvre was successful in 20, a clean pupil being secured. In the other 5 the capsule ruptured and remained in the eye without, however, prejudicing the result. No prolapse of vitreous occurred. DANTONE.

BOGGI (317) describes a case of luxation of the lens into the vitreous which caused no symptoms for three years, and then from some unknown cause the lens having passed into the anterior chamber, the eye became very painful. As the author was about to resort to an operation, Rampoldi suggested massage, which being done with the fingers on the closed lids, forced the cataractous lens back into the vitreous. To prevent recurrence, the pupil was kept small by miotics. DANTONE.

320. There were 169 extractions at the N. Y. Eye and Ear Infirmary during the year. 79.33% were simple extractions. 13.01% with iridectomy; 4.73% linear extractions and needlings. Prolapse of iris occurred in 12.43% of cases. The average time of its appearance was 2.7 days after the operation. Three cases of intra-ocular hemorrhages and two of iritis. Discision of capsule done in 28.4% of the cases. Of the recorded ultimate vision, it was 0 in 4.8%. BURNETT.

XVIII.—RETINA AND FUNCTIONAL DISTURBANCES.

321. AMMAN. Retinal hemorrhages with disseminate choroiditis. *Inaug. Dissert.*, Zurich, 1896.

322. BASSÈRES. Retinal hemorrhage of malarial origin. *Arch. d'opht.*, xvi., 6, p. 352.

323. DOLGANOFF. On retinal changes in infectious diseases. *Arch. f. Augenh.*, xxxii., iii., p. 261.

324. LODATO. Gummous retinitis premonitory of cerebral syphilis. *Arch. di Ottalm.*

325. WELTERT. A case of "retinitis circinata." *Arch. f. Augenheilk.* (colored plate), xxxii., p. 187.

326. BOCCHI. On a case of retinal tumor. *Ann. di Ottalm.*, xxv., 2–3, p. 204.

327. WINTERSTEINER. On corneal changes in glioma of the retina. *Arch. f. Augenh.*, xxxii., p. 154 (to be translated).

328. SCHÖBL. Cryptoglioma retinæ. *Centralbl. f. prakt. Augenheilk.*, xxii., p. 130.

329. PERGENS. Aneurysmal dilatation of the macular vessels. *Zehender's klin. Monatsbl.*, xxxiv., p. 170.

330. BAQUIS. Clinical study of a case of detachment of the retina in relation to our knowledge of the nutrition of the retina. *Ann. di Ottalm.*, xxv., 2–3, p. 241.

331. SCHNEIDER. On the transmissibility by inheritance of retinitis pigmentosa, with a family history of retinitis pigmentosa in five generations. *Inaug. Dissert.*, Berlin, 1896.

332. SCHTSCHEPOTJEN. On epidemic hemeralopia. *Arch. f. Augenheilk.*, xxxii., p. 194.

333. BULL, OLE. On lunar amblyopia. *Norsk. Mag. f. Læger*, 1896, No. 6, p. 598.

334. STIEL. On periodic disturbances of vision due to opacity of the cornea. *Centralbl. f. prakt. Augenheilk.*, 1896.

335. CRAMER. On unilateral amblyopia peripherica acuta. *Zehender's klin. Monatsbl.*, xxxiv., p. 122.

336. DEMICHÉRI. The field of vision in cases of central scotoma. *Arch. d'opht.*, xvi., 4, p. 226.

337. SALIS. Transient monocular hemianopsia from the use of cocaine. *Ann. d'ocul.*, cxv., p. 285.

338. GOLDZIEHER. A contribution to hemianopsia. *Budapester Königl. Gesellsch. d. Aerzte*, Apr. 11, 1896.

339. PETERS. On the relation between disturbances of orientation and unilateral and bilateral hemianopsia. *Arch. f. Augenheilk*, xxxii., p. 175.

340. ALT. Diabetic retinitis. *Amer. Journ. of Ophth.*, May, 1896.

341. TRAVIS, B. F. Sudden blindness with complete recovery. *Oph. Record*, Apr., 1896.

342. FRIDENBERG. A case of binasal hemianaposia following cranial traumatism. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1896.

BASSÈRES (322) reports twelve cases of retinal hemorrhage in malaria patients in the Madagascar campaign. These hemorrhages are frequent in regions in which malaria assumes severe forms, and complaints of disturbance of vision are numerous. The hemorrhages are the direct consequence of the general disease, since albuminuria and heart lesions are not found. The hemorrhages appear either in the attack or in the cachectic stage. They are mostly in the nerve-fibre layer about the disc and macula, and usually occur in both eyes. The eyes recover perfectly when the malaria is cured. The author believes the hemorrhages to be due to the formation of parasitic thromboses or to changes in the vessel walls. v. MITTELSTÄDT.

DOLGANOFF (323) reports on the ocular condition of animals infected by subcutaneous injections of an emulsion of staphylococcus aureus. He found: 1. Imbibition of the optic nerve with white blood-corpuscles. 2. Alteration of the vessels (vacuoles in the endothelial cells and plugs stopping the lumen of the vessels. 3. Œdema of almost all the layers of the retina and degeneration of the ganglion cells. 4. An albuminous exudation and homogeneous masses among the nerve fibres. 5. Destruction of the elements of the layer of rods and cones in consequence of the pressure of an inflammatory exudation. 7. An increase in the number of fibres in the vitreous.

LODATO'S (324) patient was a woman of thirty, with syphilis, who had suffered from orbital periostitis causing exophthalmus. On examining her eyes he found about the blurred optic disc the yellowish white spots, as large as a millet seed, which Oswald has described as forerunners of syphilitic brain disease. This view was confirmed in this case. Shortly after, the exophthalmus increased, the lids were swollen, and a corneal ulcer developed. There were also giddiness, epileptiform convulsions and vomiting, and the pain extended over the entire head. The usual antisyphilitic treatment was useless, probably because improperly carried out. Intravenous injections of sublimate were then employed, and six of them sufficed to bring the affection under control. All the symptoms disappeared, and the resulting vision was $\frac{8}{9}$. DANTONE.

The retinal tumor described by BOCCHI (326) differed considerably in structure from the usual glioma. Masses of spindle cells, with a large nucleus and little protoplasm, were arranged concentrically about the blood-vessels, having apparently arisen from the vessel walls. Farther from the vessels were groups of lymphoid cells. The author therefore classifies this tumor as a perivascular lymphosarcoma of the retina. The choroid was completely atrophic and the retina totally detached.

DANTONE.

SCHÖBL (328) designates by the term cryptoglioma such cases as are really glioma, but in which the clinician is unable to make a correct diagnosis. It is the opposite condition to pseudo-glioma in which one of several less important conditions is mistaken for true glioma. The main difficulty in diagnosing glioma is when, in the second or inflammatory stage, instead of glaucoma, iridocyclitis comes on, leading to transient phthisis. The cases reported by Schöbl are classic. In one case he diagnosed iridochoroiditis purulenta partialis chronica tuberculosa oculi dextri and granuloma tuberculosum corp. ciliar. penetrans in cameram anter. oculi sinistri, and nevertheless the case proved to be one of glioma. From his extensive experience, Schöbl comes to the conclusion that in the development of cryptoglioma two factors work together, viz., an indirect inflammatory process of the uveal tract and a special inclination of the neoplasm to early and extensive metamorphosis. The chief clinical pictures that cryptoglioma simulates are three : (1) plastic iridocyclitis, with occlusion of the pupil ; (2) chronic panophthalmitis ; and (3) tuberculosis of the ciliary body or choroid.

PERGENS'S (329) patient was blind, with chalky-white, sharply outlined optic discs. In the yellow-colored region, corresponding to the distribution of the macular bundle, there were a number of aneurysmic dilated vessels. No light was thrown on this condition by the history.

BAQUIS'S (330) patient, a young man who had already lost one eye from iridocyclitis, consulted him for a traumatic detachment of the retina in the other eye, which was myopic. The retina was detached on the temporal side from the ora serrata nearly to the disc, and was so folded that, to some extent, it overlay the nasal half of the retina. Two weeks later the retina again lay in position, and the patient could see as well as before. Two days after this the detachment recurred and remained permanently. It was now found that objects in the remaining temporal field were con-

stantly projected by the patient into the nasal field; thus the spokes of a turning wheel were seen by the patient as if moving in the opposite direction. Other details of this remarkable case must be seen in the original paper. DANTONE.

SCHNEIDER (331) gives a brief résumé of the important papers on the nature and etiology of retinitis pigmentosa. As proof of the hereditary nature of the disease, he reports the case of a family in which five generations were affected.

A sailor of twenty-six, who had previously enjoyed good sight, six years ago slept with two companions on the deck of a ship off the coast of Honduras in the bright moonlight. When they awoke all had great difficulty in seeing, and this condition lasted unchanged for two months. He then separated from his companions, whom he lost sight of. Cod liver oil was ordered by a physician, and under its use his sight improved. When examined by OLE BULL (333) he had a slight conjunctivitis, no signs of iritis, and responsive pupils. Over the entire visible surface of both lenses were scattered numbers of small bluish spots. When the pupil was dilated the periphery of the lens was found to be clear. $V = \frac{4}{15}$. Color sense reduced one half. Visual field normal. The diminished vision seemed to be due solely to the changes in the lenses. The moonlight was regarded as the cause of the affection. Similar cases have not been described. Moon blindness is mentioned by Stellwag. Demours stated that naval physicians were familiar with the fact that sailors who sleep on deck at night frequently become affected with hemeralopia.

STIEL (334) reports the case of a patient with a slight macula over the pupil, who complained at times that objects appeared blurred, and that he then had diplopia, dizziness and headache.

CRAMER (335) found acute peripheric amblyopia in a man of sixty-five, who complained of cloudiness of vision and of seeing phosphorescent images. The concentrically contracted visual field showed an absolute defect outward of 15–25°, within which was a relative defect of about 10°. Recovery under the use of foot baths and iodide of potassium. As Masselon stated, as long ago as 1872, there is frequently in toxic amblyopia not only a central but also a peripheric scotoma, which is usually located in the upper field.

DEMICHÉRI (336) by several observations confirmed the fact that peripheric defects in the field may often be found with retrobulbar neuritis. The scotoma usually shows itself as an incurving

of the upper limit of the field, which in rare cases may extend downward until the peripheric defect meets the central defect. The peripheric defect is, however, always a relative one, and is thus distinguished from the usual sector-formed absolute defect. This peripheric defect occurs both in toxic amblyopia and in retrobulbar neuritis of other origins. v. MITTELSTÄDT.

GOLDZIEHER (338) reports three cases of temporal hemianopsia. The causes were thought to be, respectively, a tumor of the hypophysis cerebri, an aneurysmal dilatation of a vessel running in the middle line of the chiasm, and an exudation about the chiasm. In this last case the right temporal field was wanting, and in the left temporal field there was total color blindness with a complete field for white.

In PETERS'S (339) case a man of sixty-eight, after a sudden attack of homonymous hemianopsia, showed those disturbances of orientation that were first described by Förster. The patient was kept under observation for a long time. At the autopsy foci of softening were found in the medullary layer of both occipital lobes, with which corresponded the visual field late in life, but the external cortical portions of the occipital lobes were healthy. The common view that these disturbances of orientation have their seat in the cortical layer must therefore be given up. In unilateral (homonymous) hemianopsia the other hemisphere is supposed to assume this function, but in this case nothing of this sort was noticed. The correct explanation seems to Peters to be that the seat of the disturbance is a lesion of no great extent lying in the association tracts which run in the middle line. These tracts transmit the single visual impressions of other portions of the brain which are combined to produce the "optic series," projections in space, groupings, and consequently orientation.

ALT (340) reports three cases of retinal changes in diabetic patients. In the first, there was much swelling of the disc with whitish exudation extending to the macula region. In the second, there were only shiny ivory-colored round spots in the macula and around it. In the third, there were innumerable punctiform hemorrhages all over the retina of the left eye and at the periphery of the right. BURNETT.

In the case reported by TRAVIS (341), a man of thirty, in perfect health, noticed that his left eye was poor for some weeks. Suddenly he became totally blind in both. There was not even

perception of light. Still the pupils were said to be small and responsive to light. Ophthalmoscopic examination revealed a narrowing in the calibre of both arteries and veins, and the next day the retina had a milky white appearance. Three days later vision returned with excruciating pain in the depth of the orbit. Perfect in the right and $\frac{20}{100}$ in the left. BURNETT.

FRIDENBERG (342) reports a case of binasal hemianopsia which followed a blow on the top of the head not accompanied by unconsciousness. The eye trouble, it appears, came on gradually. The dividing line ran slightly to the nasal side of the point of fixation in both. Both discs were grayish white, and the vessels were contracted in diameter. There was red-green blindness. Pot. iodide was given in increasing doses, but with no effect. Some cases from other sources are also recorded in more or less detail. BURNETT.

XIX.—OPTIC NERVE.

343. SHANNON, J. R. Acute vision with choked discs. *Manhattan Eye and Ear Hosp. Report*, Jan., 1896.

Shannon reports a case of pronounced choked discs in a girl of fourteen with normal vision, with no change for about a year, during which she was under observation. From the symptoms—headaches, nausea, vomiting, and dizziness—there was likely an intracranial tumor. She died with symptoms of meningitis. No autopsy. BURNETT.

XX.—INJURIES. FOREIGN BODIES (PARASITES).

344. HILLEMANNS. On injuries of the eye. 2nd part. *Arch. f. Augenheilk.*, xxxii., 3, p. 198.

345. KRIENES. A contribution to the injuries of the eye. *Festschrift z. F. d. 100-jährigen Stiftungsfestes d. militär-ärztlichen Bildungsanstalten zu Berlin.* Hirschwald, 1896.

346. OVIO. On the penetration of shot into the eyeball. *Ann. di Ottalm.*, xxv., 1, p. 68.

347. BUSINELLI. On peripheric detachment of the iris. *Clinica moderna*, vol. ii., 1.

348. SCHIÖTZ. A foreign body in the eye. *Norsk. Mag. f. Laegenids Forhandl.*, 1896, p. 224.

349. HEIDENREICH. A cast of the cornea. *Ibid.*, p. 55

350. TORNATOLA. On injuries of the eye, caused by fire-arms. *Arch. di Ottalm.*, iii., 11–12, p. 350.

351. HIRSCHBERG. On magnet operations (with the presentation of a patient). *Berliner med. Gesellschaft*, June 3, 1896.

352. FROMAGET. A vegetable foreign body in the eye simulating a malignant tumor. *Gaz. hébdom. des sciences méd. de Bordeaux*, 1896, p. 56.

353. VARESE. A case of ocular paralysis from auto-intoxication by worms. *Arch. di Ottalm.*, iii., 9–10, p. 309.

HILLEMANNS (344) reports two cases of foreign body in the optic nerve, and a case of gun-cap injury in which later a peculiar copper deposit formed on the anterior capsule. Vision was normal, the piece of cap lying in the fundus.

KRIENES (345) records cases of traumatic cyclitis (spasm of accommodation, hypertony and glaucoma, glaucoma after discission of secondary cataract), of traumatic anterior capsular cataract, of traumatic anterior cortical cataract, and of traumatic insufficiency of the pupil.

OVIO (346), having observed a case in which a shot remained three months in the eye without causing irritation, in spite of the fact that an operation had been done for the traumatic cataract, was led to make experiments in the matter of shot injuries, and he found that the discharge rendered the shot completely aseptic, except when they had previously been brought into contact with spores of splenic fever. Ordinary shot, disinfected with boiling water, caused no inflammation when brought into the anterior chamber or vitreous of rabbits. The author has never seen shot become encapsulated. DANTONE.

After a severe contusion of the eye, the anterior chamber in BUSINELLI'S (347) patient became filled with blood. After absorption of the blood the iris was found to have disappeared completely, no trace of it being found. The lens and the fundus were however intact, and when provided with a stenoptic slit the patient could see as well with this eye as with the other.

DANTONE.

In a peasant of forty-nine, SCHIÖTZ (348) found the upper half of the conjunctiva as empty as after enucleation, but the lower half was occupied by a black, oblique-lying mass resembling a tumor. The patient stated that thirty-three years before a piece of white-hot iron as large as a coffee grain had flown into the left

eye. Eight weeks later he was able to resume work, but the left eye was blind, shrunken, and without a cornea. Recently there have been periodic attacks of pain and mucous discharge. The black mass was found to be metallic and when removed with forceps proved to be a piece of iron considerably oxidized, 2.2 *cm* long, 1 *cm* in greatest breadth, and 8 *mm* high. In the depth of the conjunctival sac lay a small mass having a fistulous opening bordered with pigment, which probably represented the eyeball which had become shrunken after extruding the piece of iron.

HEIDENREICH's (349) patient, a boy of ten, poured melted tin into the barrel of a toy cannon. There was probably powder in the barrel and an explosion occurred in the boy's face. Small burns and excoriations were found on the cheeks and eyelids, and the entire left cornea was covered with a bright plate of metal, which was removed, when the cornea was found to have suffered only a slight loss of epithelium. Ten days later the cornea was clear and the eye normal.

In 21 cases of perforating shot wounds of the eye, TORNATOLA (350) has seen sympathetic ophthalmia only once. This he thinks due to the antiseptic treatment of the small wound and to the fact that shot fired from a gun are aseptic, although shot as found in the shops are always infected with microbes, and frequently the author was able to obtain from them cultures of the staphylococcus albus. In experimental shot wounds in the eyes of rabbits and guinea-pigs, the eyes retained their form and tension in 8 cases out of 10 when the eye had been disinfected before the injury, and the wound subsequently treated antiseptically. But of 20 eyes similarly injured when no such treatment was instituted, 14 became phthisical from iridochoroiditis, 5 suppurated, and but 1 retained its normal appearance. DANTONE.

HIRSCHBERG (351), who introduced his electromagnet in 1879, spoke of the good results obtained with this instrument. In 14 cases out of 15 he was successful in removing the splinter of iron. In the first ten years of his practice, before the magnet came into use, he had not seen a single favorable outcome in a case of iron splinter in the vitreous, while now he has 13 cases, some of them with normal vision. After citing several cases he concluded by stating that he preferred his magnet to the giant magnet, the use of which had been followed by some bad results; he conceded, however, that in some cases the larger magnet might do better service, and that the indications must be carefully considered in each individual case.

FROMAGET (352) reports the case of a child of ten brought to his clinic for complete blindness of the right eye and inflammation. Examination revealed a total detachment of the retina and secondary increase in tension. The diagnosis of intra-ocular tumor was made and the eye was enucleated. There was then found a purulent focus in the choroid, in the centre of which was the thorn of a rose. SULZER.

VARESE (353) saw a paralysis of the sixth nerve, accompanied with headache and vomiting in an otherwise healthy and strong woman of twenty-four. No direct cause could be made out, but since the patient complained of constipation a large dose of calomel was given, and this led to an explanation of the affection by causing several intestinal worms to pass, after which the headache and diplopia disappeared. The author regards the affection as being due to an auto-intoxication from the excrements of the worms and their influence on the contents of the intestines, which from the slowness of the peristaltic movements underwent chemical degenerations. DANTONE.

XXI.—OCULAR DISTURBANCES IN GENERAL DISEASES.

354. PICK. A symptom similar to Graefe's without other signs of tabes. *Prag. med. Wochenschr.*, No. 49, 1895.

355. KOENIG. On the condition of the cerebral nerves in infantile cerebral paralysis. *Zeitschr. f. klin. Medicin*, xxx., 3–4.

356. FERNANDEZ, SANTOS. Tetanus following enucleation of the eyeball. *Rev. génér. d'opht.*, p. 58, 1896.

357. FEILCHENFELD. Complete paralysis of accommodation from oyster poisoning. *Zehender's klin. Monatsbl.*, xxxiv., p. 129.

358. MARINA. On multiple ocular-muscle paralyses and their relation to the affections, chiefly nervous, producing them. Deutike, Leipsic-Vienna.

359. GROCZ. The ocular symptoms of tabes. *K. aerztlicher Verein in Budapest Sgemészot*, No. 2, 1896.

360. GALEZOWSKI. On syphilitic ocular heredity in the second generation. *Rec. d'opht.*, 1896, p. 1.

361. SKLADNY. On the development of smooth atrophy of the base of the tongue in consequence of hereditary syphilis. *Inaug. Dissert.*, Berlin, 1896.

362. NOVELLI. The transitory amaurosis of the albuminuria of pregnancy. *Boll. d'ocul.*, xviii., 4, p. 25.

363. SIMI. Infective inflammations of the eye. *Ibid.*, p. 28.

364. ANGELUCCI. The surgical treatment and the prognosis of œdema of the optic disc in cerebral affections. *Arch. di Ottalm.*, iii., 9–10, p. 286.

365. LODATO. On softening of the sigmoid gyrus with left-sided ptosis. *Arch. di Ottalm.*, iii., 9–10, p. 322.

366. RANNEY, A. L. The relation between eye strain and epilepsy. *Annals of Oph. and Otol.*, April, 1896.

PICK (354) showed an insane patient with a tonic spasm of the elevators of the lids. In looking downward the upper lid remained behind and was spasmodically drawn upward.

KOENIG (355), in his papers, records 72 cases, 17 of which came to autopsy. Of the nerves which chiefly interest the oculist the first is the ocular branch of the facial which was affected in 3 cases. The oculo-motor (simple differences in the size of the pupils with normal reaction being overlooked) was affected 8 times, in 6 the inner branches, in 1 the outer, and in 1 both inner and outer being involved. The 3 cases on which autopsies were made had in general the same macroscopic changes, viz., chronic leptomeningitis, internal hydrocephalus, and ependymitis, a condition macroscopically similar to that found in advanced paralytic dementia, but microscopically different. In 2 of the 8 cases lues was present, which was probably responsible for the paresis of the inner muscles. Strabismus divergens was found twice, convergens once, unilateral paralysis of the abducens 3 times, and bilateral 5 times, no etiological factors being discoverable. The optic nerve was atrophic in 12 cases or 16 %, in 2 the atrophy being unilateral. A particular form of the skull, the sugar-loaf head, was not found in these cases, in which others have reported finding it. The cause of the atrophy is to be sought for in central inflammations which may be intra- or extra-uterine. He concludes with some remarks on pseudo-bulbar paralyses which are found in children.

The bibliography cited by FERNANDEZ (356) shows that tetanus following injury of the eye is not so rare as it is believed to be. In the author's case the eye was enucleated for a sarcoma of the interior. Trismus appeared five days after operation and death followed on the tenth day. SULZER.

MARINA (358) has given us a broadly planned and valuable book of 320 pages, treating in 13 chapters of all the ocular-muscle paralyses in their relation to organic and general diseases.

He records his own observations and those of others in a spirit of judicious criticism. The book is well arranged according to subjects, the paralyses due to tabes, sclerosis, general diseases, etc., being treated of under separate headings.

GALEZOWSKI (360) has seen certain eye inflammations such as keratitis and particularly choroiditis, which were altogether similar to the specific inflammation of these tissues, while no other signs of acquired or hereditary syphilis could be discovered. These affections were stationary or were improved by anti-syphilitic treatment. More careful investigation revealed the fact that the parents of the patients had suffered from hereditary syphilis. The case histories recorded show the affections to have been interstitial keratitis and choroiditis with small foci. SULZER.

SKLADNY (361) in his paper gives a short account of the signs of hereditary syphilis. Regarding Fournier's doctrine of a lues tarda as probably incorrect, he adds to Hutchinson's triad of symptoms that of smooth atrophy of the base of the tongue.

In a young woman with albuminuria in the fifth to seventh month of pregnancy, NOVELLI (362) saw blindness come on in both eyes within a few days, with œdema of the discs and hemorrhages. After an induced abortion vision began to return and was fully restored three months later. DANTONE.

In the course of an epidemic of mumps in Florence, SIMI (363) saw a young man with mumps on the left side develop, after the disappearance of the fever, a bilateral disturbance of vision due to dilatation of the pupils and congestion of the optic discs. All symptoms vanished after a week's treatment with calomel.

DANTONE.

ANGELUCCI (364) now gives further accounts of the three patients trephined for choked disc. One of the patients has died since from his brain disease, but as regards the hemorrhages in the optic nerve the results of the operation on this patient as well as of those on the two patients still living, could not have been more favorable, and the author therefore urges that surgical procedures should not be delayed when a degeneration of the optic nerve can be prevented in this way. Even in tumors which cannot be removed and in such as can only be partially extirpated, the operation has a favorable effect upon the general condition and particularly the pathological process in the optic nerves.

DANTONE.

LODATO (365) speaks of a case reported by Herter (*Journal of*

Nervous and Mental Diseases, 1895, No. 1) in which a focus of softening 36 *mm* in diameter was found in the region of the angular gyrus, after a ptosis of the opposite side had been observed. The author contends, on the ground of his experiments on dogs, that the peripheric centre for the elevation of the lid lies not in the angular gyrus but in the sigmoid gyrus. Furthermore, injury of the gyrus angularis has been seen repeatedly without any subsequent disturbances in the mobility of the lids. In Herter's case the extension of the focus must have affected the white matter. DANTONE.

RANNEY (366) relates a case of epilepsy (*grand mal*) in a perfectly healthy woman of thirty years, who had been unsuccessfully treated by bromides and animal extracts, but who recovered after a heterophoria (esophoria and hypophoria), which was for the most part latent, had been corrected by numerous tenotomies. There had been no return of seizures one year after they were stopped. BURNETT.

BOOK REVIEWS.

I.—**System of Diseases of the Eye,** by American, British, Dutch, French, German, and Spanish authors. Edited by WILLIAM F. NORRIS, A.M., M.D., and CHARLES A. OLIVER, A.M., M.D., of Philadelphia. Vol. I., Embryology, Anatomy, and Physiology of the Eye, pp. 670, octavo, with twenty-three full-page plates and three hundred and sixty-two text illustrations. Philadelphia: J. B. Lippincott Company, 1897.

This long-expected volume will, in the main, meet the reader's expectations both as regards completeness and freedom from error, and it will be found to be for the most part interesting reading. Indeed, it leaves little to be desired, and adverse criticisms must be mostly trivial.

In a new book naturally the first thing to attract attention is the illustrations, and their degree of originality is apt to be regarded as an indication of the originality or at least of the freshness of the text. For this reason we are sorry to say that the illustrations, taken as a whole, are somewhat disappointing. The majority of them are old, many are not only familiar but are even hackneyed, and several of the latter have been used twice in the volume. Such drawings as those by Leber, Sappey, and Arnold of the blood supply of various parts, and those by Cajal of the retina, are probably not to be improved upon and it is pardonable to use them; but with so great a material to choose from, the selection of a microscopic drawing of the iris (p. 49) exhibiting a layer seven cells deep, designated as the anterior endothelium of the iris, is inexcusable. The original drawings seem to be accurate, but a number of them reveal a lack of the technical skill required to bring out clearly the salient points in the object represented. Thus, for example, of the several illustrations of the choroid none seems altogether adequate. Half-tone reproductions of photomicrographs, which are now so popular but which so rarely eluci-

date the text, appear but twice, one (p. 430) being much better than the common, and the other being (p. 388) worthless for purposes of illustration.

A few words might here be said in regard to some points in nomenclature. German writers in coining new descriptive terms frequently use colloquial expressions which unfortunately do not always readily suggest an equivalent in another tongue. And to avoid the confusion arising from the awkward and ununiform translation of such terms, some English writers have felt forced to employ the original German words. Thus Minot in his *Embryology* uses "Anlage" and some other such words throughout. But now that Wilder has given us a precise equivalent of "Anlage" in "proton," we may hope to see a little philological ingenuity employed and these German words supplanted. In the present system of diseases of the eye, which must long remain the authoritative treatise in English, the opportunity was presented of editing it with a view to the establishment of a uniform standard of English ophthalmological nomenclature. But unfortunately the term "Randschleier" is repeatedly used in one section of the book (p. 58) and its equivalent "velum confine" in another (p. 384). One writer uses the spelling "chorioid," now becoming popular in Germany because etymologically more correct than "choroid," while the others use the latter spelling. "Threshold of stimulation (Reizschwelle)" appears on page 605, and on page 617 "irritation" is used repeatedly in a translation, the original German term being undoubtedly "Reiz." "Reiz," strictly speaking, means neither stimulation nor irritation, but excitation, and "Reizschwelle" means threshold-excitation, or better, liminal excitation.

In scope and general arrangement the present system greatly resembles the *Handbook* of Graefe-Saemisch, with which it naturally challenges comparison. The chief merit of Graefe-Saemisch, and one which will not be superseded, lies in the fact that many of its authors were original investigators in the matters of which they wrote, and this renders the book authoritative in a degree to which no book more of the nature of a compilation can ever attain. Most of the Graefe-Saemisch articles are in every respect excellent, and some will long remain classic models of this sort of literature; but parts of the book are undeniably obscure, many more are diffuse, and much of it is tedious and unnecessarily difficult to read. In this respect it may be improved upon.

The present English volume corresponds to volumes I. and II. of the German, and has half the length of the latter. It begins with sixty pages on the development of the eye by the late Prof. Ryder of the University of Pennsylvania. This article contains about fifty illustrations, one of which, a valuable drawing, by the way, is original. This, however, is one more original drawing than appears in the corresponding article in Graefe-Saemisch by Manz. If this article is not so satisfactory as many others in the book it must be remembered that the difficulty of the subject is such that so far no one has been able to write a complete and detailed account of the development of the eye that has not been more or less confusing and incomprehensible. On the whole, the article is good, although it contains some loose statements, and in places it exhibits a lack of precise and orderly arrangement. Under the caption "development of the lens" we look in vain for any account of the capsule of the lens, and its first and only mention is ten pages farther on, under "vitreous humor," where it is stated, without qualification, that the capsule of the lens is a product of the membrana vasculosa lentis. Yet Piersol, in the histological part of the volume (p. 353), discusses both this view and the other, now held by many embryologists, viz., that the capsule of the lens is a cuticular deposit from the ectodermic cells of the lens-sac, he personally favoring the former, and Lang and Collins, in the article on malformations (p. 418), state both views, and personally favor the latter.

After the embryology comes the anatomy—forty pages by Prof. Dwight, of Harvard, on the orbit and appendages of the eye, 108 pages by Prof. Baker, of Georgetown University, on the eyeball and optic nerve, 166 pages by Prof. Piersol, of the University of Pennsylvania, on the microscopic anatomy of the eyeball, and twenty-two pages by Prof. Hill, of Cambridge, Eng., on the anatomy of the intra-cranial portion of the visual apparatus. In Dwight's article, which contains a number of new illustrations, the treatment of the anatomy of the orbit and appendages of the eye is largely topographical. The histology of the lids and lachrymal gland is taken up in this chapter only, and the description is rather meagre as compared with that of the histology of the eyeball. The author always writes to the point. His sentences are short, crisp, and unambiguous, yet so disconnected often that the style grows monotonously choppy. Baker's article on the anatomy of the eyeball is very readable, and the historical

footnotes and also the notes on derivations and synonyms are valuable. The article seems unnecessarily long, however, and the author has encroached upon the subject-matter of both the preceding and the succeeding article, thus leading to considerable redundancy both of text and illustration. Piersol's article on the histology of the eyeball is the longest in the volume, the most important, and also the most felicitous in execution, it being written in a scientific style which is as rare as it is admirable, and which cannot be too highly praised. The illustrations are mostly drawings by the author, some of which have appeared in his text-book of histology. Hill's article on the intracranial portion of the visual apparatus is not purely anatomical, but rather such an account as would be found in a text-book of physiology. There is no article in this volume corresponding to the fifty-five pages by Leuckhart in Graefe-Saemisch on the comparative anatomy of the eye.

The next article, consisting of forty pages on the congenital anomalies of the eye by Lang and Treacher Collins, of London, gives the impression, perhaps more than any other in the volume, of being authoritative, the authors having had unusual facilities for studying such cases, and the illustrations being original.

The remaining two hundred pages of the volume are devoted to physiological optics. This subject, which was covered by Aubert alone in Graefe-Saemisch, is here divided among five authors. The dioptrics of the eye and normal color perception, which are of clinical importance, have been written by clinicians in an elementary manner intelligible to the clinician, while the articles on the perception of light by Cattell, on binocular vision, etc., by Brodhun, and on the photo-chemistry of the retina by Mays, will appeal more to the advanced physiologist. It will be noticed that Jackson's dioptrics of the eye comprises only the optical principles necessary to the understanding of refraction, matter which in Graefe-Saemisch appears in a different volume, while Aubert's eighty-five pages on the dioptrics of the eye in Graefe-Saemisch is taken up mostly with demonstrations of the refraction of a series of curved surfaces and their application to the eye. But Aubert took this almost bodily from the Physiological Optics of Helmholtz, who first made the calculations, and who has presented them in the clearest possible manner, and there seems to be no reason why this chapter should be transcribed again.

The article on color perception, consisting of thirty-five pages,

by Prof. THOMPSON and Dr. WEILAND, of Philadelphia, although it covers the subject well, still leaves something to be desired both in the selection of the material used and in style of execution, while its tone too often suggests the popular lecture rather than the scientific treatise.

These few points that have been criticised are not to be understood as detracting particularly from the value of the book. As said before, the volume is complete, remarkably free from mistakes, and on the whole satisfactory. If the other volumes of the system prove to be up to the standard of this one, a work will have been accomplished that is worthy of high praise.

W. A. H.

II.—**Cure of Excessive Myopia** (Heilung höchstgradiger Kurzsichtigkeit, etc.). By V. FUKALA, of Vienna. Franz Deuticke, Leipsic and Vienna: 1896.

This monograph of 192 pages with 28 figures in the text is exceedingly instructive and important. It treats of the cure of the highest degrees of myopia (16 D and over) by the removal of the crystalline lens. With this subject the author's name has been pre-eminently connected during the last years. The monograph begins with the history of the subject and discusses the problem exhaustively in every direction. It is divided into two parts, a medical and an optical one.

Excessive nearsightedness being almost blindness, and spectacles affording little relief, has for a long time suggested to the medical mind its cure by the removal of the crystalline lens. HERMANN BOERHAAVE was the first to recognize, in 1746, that elongation of the axis of the eye was the cause of myopia; MORGAGNI was the first to demonstrate it anatomically (1761). AUG. GOTTLIEB RICHTER (Göttingen), 1790, proposed extraction or depression of the lens to cure it. BEER (Vienna), 1817, advised the operation, but, afraid of its difficulty, did not perform it.

In the first half of the nineteenth century a number of renowned surgeons (Froriep, J. René, Guérin, Bonnet, etc.), in the erroneous belief that the elongation of the eyeball was caused by the pressure of the muscles on the globe, performed subconjunctival tenotomies. MOOREN recommended extraction of the transparent lens in 1858, but was opposed by v. Graefe, Donders, and others. His first case was a failure. W. F. Smith, of Chicago, according to C. A. Wood's statement in *Am. Journ. of Ophth.*, 1890, p. 360, removed by flap extraction the transparent lens of a thirty-five-

year old myope of 20 D. The result was S $\frac{20}{30}$ three months later.

Fukala's first operation (discission) in 1887 was a success. Soon afterward the removal of the lens for the cure of excessive myopia became generally recognized as a legitimate and useful operation, and has been adopted by many prominent oculists.

Fukala considers the operation indicated for young subjects only, but includes an age of thirty, even forty years. The vision of the eye should be no less than 0.1. "Where J. 1 or 2 is not read fluently near by, an essential advantage is not to be expected from the operation." The accidents are hemorrhage and detachment. The danger is greatest if extraction is done without preliminary discission. Mooren, who extracted without discission, had poor results. Progressive choroidal atrophy is no counter-indication, but requires particular precaution. Some operators confine the operation to one eye. Fukala finds that the patients are much more benefited if both are operated on.

His method is discission with subsequent paracentesis of the cornea or *extraction.* At first he made the discission rather small, now he divides the lens very extensively, in the first operation (p. 48). Extremely seldom he makes a preliminary iridectomy. If after free division of the lens considerable swelling by imbibition occurs, it can be immediately remedied by a paracentesis of of the cornea. In this way the recovery may be complete in four weeks, whereas, with the customary small incisions, five to nine months may be required. He cocainizes the eye, dilates the pupil with atropine before the operation, and uses a narrow Graefe knife for the division of the lens. If the division of the lens does not prove sufficient by one attempt, he removes the knife and reintroduces it at once at another place, thus dividing the lens by several crucial incisions. In some cases the division of the lens has to be repeated two or three times; mostly, however, the breaking up of the lens is soon followed by symptoms of irritation and increase of eyeball tension. Puncture (paracentesis) is then in order, and can be repeated several times, but if the reaction be great, and not relieved by paracentesis, extraction of the broken up and swollen masses should be done by a linear corneal incision with a lance-shaped or a narrow Graefe knife.

Fukala is very enthusiastic of the results of this operation. He considers the operation almost totally safe; detachment of the

retina, which has been observed, is not caused by the operation, the progress of the myopia is checked in the great majority of cases, the patients can see without glasses distinctly at the distance of 1′ or 2′, and the visual acuteness in most cases is greater than before. Binocular vision, which was impossible to these patients before, is acquired in most cases, when both eyes have been operated on.

Fukala's operation has been adopted by many oculists: Schweigger, about 100 cases, Pflüger 100, v. Hippel 80, Sattler (Leipzig) 80, Thier (Aix-la-Chapelle) 100, Theo. v. Schröder (Russia) 20, Mooren 20, Horstmann 15, Pergens (Brussels) 14, Haab (Zurich) 22, and many others. Tables of the methods of operation and the results of Schweigger, Pflüger, v. Hippel, and Vossius give a very encouraging picture of the value of this new and already quite popular dealing with the cases of excessive myopia.

The second part of the monograph is an elementary presentation of the dioptrics of the eye, with and without a crystalline lens, of spectacle lenses, in such a manner as is found in many text-books and monographs, all of which more or less leaning on the famous § 9 in Helmholtz's *Physiological Optics*. The presentation of Fukala has particular didactic value, in so far as it is accompanied by a great many practical (school-boy) examples, the solution of which is given in full. The treatise of Fukala deserves and will have an extended circle of readers.

H. K.

III.—Alb. Mooren, **Die medicinische u. operative Behandlung der Kurzsichtigkeit** (The Medical and Operative Treatment of Myopia). Wiesbaden: Bergmann, 1897.

This well-printed monograph of 135 large-octavo pages belongs to the class of easy professional literature which, in the form of an historical essay, treats of a scientific, practical subject, with a strong personal coloring. The discussion extends over the broad field of the occurrence, causation, and increase of myopia, the artificial ripening of cataract, the extraction of the lens in myopic eyes—of which the author is a warm advocate—the visual results of this operation, the treatment of detachment of the retina, the formation and operative treatment of kerato-conus, and the medical treatment of acquired and complicated myopia. Frequent allusion to the author's personal acquaintance with Albr. von Graefe, Donders, and other representative men

arouse the interest of the reader, which, in spite of the prolixity of the style and the somewhat desultory presentation of the subject-matter, is kept alive from beginning to end by the author's uncommonly large experience. Nobody will read a book of Mooren without receiving both enjoyment and instruction.

H. K.

IV.—**Report on the Twenty-fifth Meeting of the Ophthalmological Society at Heidelberg, 1896.** Edited by W. HESS and THEO. LEBER (in German). J. F. Bergmann: Wiesbaden, 1897.

The Heidelberg report this time appears in an imposing form, 350 large octavo pages, with three (!) text figures, on good paper. An extended review of the transactions by Greeff and Horstmann being found in an anterior part of this number, we want to draw attention to the first thirty-one pages occupied by the report of the solemn session in which, every ten years, the Graefe Medal is to be handed to the man who, among the living, possesses the greatest merit in the advance of ophthalmology. Ten years previously this prize had been awarded—it was the first time—to HERMANN VON HELMHOLTZ, this year the honor was adjudged to THEODORE LEBER. Both the oration of the occasion, by Professor v. HIPPEL, and the answer by Professor LEBER are in contents, style, and propriety laudable examples of eloquence. The subject of von Hippel's oration is a biography of von Graefe, the founder of the Society, supplemented by words of warm acknowledgment of the scientific work of the laureate. LEBER, after expressing his thanks for the honor conferred on him, said that, in his opinion, the prize should have been given to JOSEPH LISTER. He then speaks of his own endeavors and labors, dwelling chiefly on the incentive and aid he had received from his teachers Helmholtz, C. Ludwig, Arlt, Donders, Cohnheim, and, above all, Albrecht v. Graefe.

H. K.

V.—CLARENCE A. VEASEY, **Ophthalmic Operations as Practised on Animals' Eyes.** Philadelphia: The Edwards and Docker Co., 1896. $1.

This manual of 99 small-octavo pages, with 56 text-illustrations, most of them from electrotypes furnished by two instrument makers, is printed in extra large type, on heavy paper. Its object is to help "the beginner in making himself acquainted with the technique of the various operative procedures through practice on animals' eyes" put into a mask. The descriptions are short and

clear, the operative methods few in number, as it should be for the teaching of beginners. The little volume fulfils its purpose, but to get it up as an *édition de luxe* is preposterous. If the size of the type were reduced one half, and that of the volume one third, the book would be both cheaper and handier, and the student could put it like a note-book into his pocket when he goes to the Dead-House to practise on the cadaver. To practise on the cadaver is essential, and no operative course is half-way complete without it. As far as the book goes it can be trusted and, therefore, recommended.

H. K.

MISCELLANEOUS NOTES.

Prof. BOLESLAW WICHERKIEWICZ, of Posen (Prussia), has been appointed Professor of Ophthalmology at the University of Cracow (Galicia, Austria) to succeed Prof. L. RYDEL, deceased. This ophthalmic hospital will pass into the hands of his brother, Dr. BOGDAN WICHERKIEWICZ, of Danzig, Prussia.

Dr. MORITZ SCHNELLER, who practised eye surgery in Danzig, Prussia, since 1855, died November 6, 1896. He was a pupil of von Graefe, an esteemed physician, and a distinguished author in his specialty.

Dr. R. DENIG, late assistant at the University Eye Clinic in Würzburg, has been appointed Resident Assistant Surgeon at the New York Ophthalmic and Aural Institute.

Dr. TREFONTAINE, late house surgeon at the New York Eye and Ear Infirmary, has settled in Guadalaxara, Mexico.

Dr. A. DUFOUR, in Lausanne, has been appointed Lecturer on Ophthalmology.

Dr. EMILE BERGER, of Paris, has been appointed foreign corresponding member of the Spanish Academy of Medicine.

OPHTHALMOLOGY AT THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA. Last year the examination in ophthalmology for the first time was made obligatory and its results were taken into consideration in determining the standing of the candidate for the degree. In the recently inaugurated four-year graded course the members of the graduating class will be required to attend one ophthalmological lecture per week and class sections will attend daily clinics.—*Jour. Am. Med. Asso.*, p. 1247, 1896.

The program of the OPHTHALMOLOGICAL SECTION of the next meeting of the AMERICAN MEDICAL ASSOCIATION at Philadelphia,

June 1st–4th, is very extensive. The meeting of the Association, being its semi-centennial, promises to be of unusual interest.

As in other charitable institutions, there have been arranged EVENING CLINICS AT THE MANHATTAN EYE AND EAR HOSPITAL, New York, from 7.30 to 9 o'clock. They are in charge of the younger members of the medical staff.

THE NERVOUS DEPARTMENT of the MANHATTAN EYE AND EAR HOSPITAL has been abolished. Drs. E. C. Seguin, J. F. Terriberry, and W. M. Leszynky have been elected Consulting Neurologists to the Hospital.

The OPHTHALMIC RECORD, now in its sixth year, has changed its management, and seems to have omitted the otological department. It will appear on the 15th of each month in numbers of about fifty pages. The names of its editorial staff (Geo. E. De Schweinitz, F. C. Hotz, G. C. Savage, H. V. Würdemann, Casey A. Wood, W. E. Hopkins, John E. Weeks, Harold Gifford) guarantee the successful future of the journal. Dr. T. A. Woodruff, 1102 Reliance Building, Chicago, is Editorial Secretary, and L. D. Pierce, 214 S. Clark Street, Chicago, the publisher. Price, $3.00 per annum. The two numbers which thus far have appeared, make a good impression.

The ANNALS OF OPHTHALMOLOGY AND OTOLOGY have been divided into two volumes, one on OPHTHALMOLOGY, appearing on the last of January, April, July, and October, and the other on OTOLOGY, LARYNGOLOGY, AND RHINOLOGY, appearing in February, May, August, and November. Subscription price of OPHTHALMOLOGY, $4.00, of OTOLOGY, $3.00, of both together, $5.00. There will be no other change in the management of this excellent periodical, whose energy in collecting useful information from all available sources is highly commendable.

Contents of the last numbers of the Arch. f. Aug.

Vol. XXXIII., No. 4. Issued October, 1896.

28. G. LINDSAY JOHNSON (London), Observations on the Mac. Lutea. Second part, published in these ARCH., vol. xxv., p. 1, etc.

29. GEO. ABELSDORFF, Prophylaxis of Sympathetic Ophthalmia.

30. H. KRIENES, Light and Color Sense in Diseases of the Retina, Choroid, and Optic Nerve. Second part.

31. HORSTMANN and GREEFF, Report on the XXVth Ophthalmological Congress at Heidelberg, held August 5–8, 1896. Translation in this number.

Vol. XXXIV., No. 1, issued December, 1896.

1. F. DIMMER, Some Aids in Ophthalmic Teaching.

2. P. SILEX, Progressive Paralysis of the Levator Palpebræ.

3. E. PROCOPOVICI, Congenital Bilateral Paralysis of the Abducens and Facial.

4. R. DENIG, Experiments on Contusion of the Retina.

5. FR. HOSCH, Coloboma of Both Optic Nerves.

6. Systematic Report, 2d quarter of 1896. Translation in this number.

ARCHIVES OF OPHTHALMOLOGY

NOTICE TO OUR READERS.

The ARCHIVES OF OPHTHALMOLOGY contain *original papers* on all branches of ophthalmic surgery, and *original reports* on the progress of ophthalmology. The original papers occupy from two thirds to three fourths of the space, and their scope embraces all subjects of scientific and practical interest connected with this department of medicine.

The object of the ARCHIVES is to guard, solidify, extend, and diffuse the stock of acquired ophthalmic knowledge by recording the constant addition of new observations, investigations, methods and means of examination, clinical experience, instruments and remedies, and further by taking part in the discussion of the questions of the day with a spirit alike conservative and progressive.

Particular attention is paid to the preparation of the Report on the Progress of Ophthalmology. The report is intended to furnish a *complete, systematic, and early* review of the current ophthalmological literature of the world. It has been necessary to divide the work of its preparation among a number of collaborators according to the following arrangement:

Dr. ST. BERNHEIMER, of Vienna.

1. *General Ophthalmological Literature:*
   - *a.*—Text-books (not abstracts, but notes pointing out what is new and characteristic).
   - *b.*—Monographs and papers on historical, statistical, and general subjects; reports on societies and hospitals.
   - *c.*—Periodicals on our specialty (short notices of their character, time and place of publication, the titles of the original papers, with the names of their authors).

2. *General Pathology, Diagnosis, and Therapeutics*, including new instruments, apparatus, and remedies.
3. *Normal Anatomy and Physiology*, including color-blindness.

Dr. C. HORSTMANN, Prof. at the University of Berlin (Potsdamer Strasse 4):

1. *Anomalies of Refraction and Accommodation.*
2. *Eyelids.*
3. *Lachrymal Apparatus.*
4. *Muscles and Nerves.*
5. *Orbit and Adjacent Cavities.*
6. *Conjunctiva, Cornea, Sclerotic.*
7. *Injuries and Foreign Bodies of these parts.*

Dr. P. SILEX, Lecturer at the University of Berlin.

1. *Uveal Tract*, including glaucoma.
2. *Refracting Media*, including the lens.
3. *Retina and Optic Nerve.*
4. *Injuries and Foreign Bodies of these parts.*
5. *Ocular affections in connection with general diseases.*

In order to obtain complete and recent reviews on the non-German ophthalmological literature, special reporters have been selected for different countries, who will send monthly abstracts of all local ophthalmological publications to Dr. C. Horstmann, of Berlin, the editor of the Report. Dr. Horstmann will distribute these abstracts among the German reporters according to the above plan, in order to preserve the systematic arrangement which we think of paramount importance.

The special reporters are:

For America: Dr. SWAN M. BURNETT, 1770 Massachusetts Ave., Washington, D.C.

For Great Britain and Ireland: Dr. L. WERNER, 27 Upper Merrion Street, Dublin.

For France and Belgium: Drs. D. E. SULZER, Geneva, and P. VON MITTELSTÄDT, Metz.

For Germany: Drs. BERNHEIMER, Vienna, HORSTMANN, SILEX, and DEUS, in Berlin.

For Italy: Dr. DANTONE, Rome.

For Russia: Prof. HIRSCHMANN, Charkow.

For Scandinavia: Drs. OLE BULL and SCHIÖTZ, Christiania.

For Holland: Dr. C. A. H. WESTHOFF, of Amsterdam.

In the interest of our readers, who are scattered over the whole world—and whom, like ourselves, we desire to keep informed of all advances in ophthalmology,—furthermore in their own interest, authors of ophthalmological works are requested to send reprints, duplicates of journals, or copies for reviewing, to one of the above-named reporters, or to the editors or publishers of the Archives, according to their convenience.

The abstracts of American ophthalmological literature formerly appeared under a special head, but are now embodied in the systematic Report. Text-books may be specially noticed.

The number of good papers offered us for publication has increased to such an extent that it is no longer possible to translate all of them unabridged. Whenever a German paper is condensed in the English version, or *vice versa*, it will be so stated. Should any one of our readers wish to recur to the original, the editors will always take pleasure in sending it for reference.

Under the heading of "Miscellaneous Notes," there will be published all kinds of professional news which specially concern the oculist, *e. g.*, appointments, honors, resignations, vacancies, new ophthalmic hospitals, opportunities for instruction, prize questions and essays, announcement of Society meetings, etc. Brief notices of this kind will be thankfully received by the editors.

Original papers of value from any source will, as heretofore, be welcome to the ARCHIVES, and are solicited.

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NOTICE TO CONTRIBUTORS.

The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of the original papers published in this journal without giving it due credit for the same.

2. Authors will receive gratuitously twenty-five reprints of their articles. If a greater number is desired,—notice of which should be given at the head of the manuscript,—only the additional cost of presswork and paper will be charged to the author.

3. In preparing manuscript for the compositor it is requested that the following rules be adhered to:

a. Write on one side of the paper only.

b. Write without breaks, *i. e.* do not begin a new sentence on a new line. When you want to begin a new line or paragraph at a given word, place before it in your MS. the sign ¶.

c. Draw a line along the margin of such paragraphs as should be printed in smaller type—for instance, all that is clinical history in reports of cases, etc.

d. Words to be printed in *italics*, should be underscored once, in SMALL CAPITALS twice, in LARGE CAPITALS three times.

4. Authors may receive proofs for revision if they will kindly return them without delay. We beg however to remind our contributors that changes in the copy are equivalent to resetting, causing so much additional expense. We therefore request them, to make, if possible, no alterations at all in their MSS., or, at least, to limit these to what is of essential importance.

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V.—Augenärztliche Unterrichtstafeln (Plates for Ophthalmological Instruction). By Dr. Rich. Greeff.

18. Contents of the Newest Number of the *Arch. für Augenhk.* Vol. XXXIV., No. 2 (3 plates and 7 text-figures.) Issued February, 1897 315

[1] *Correction.*—This text-plate should be the IVth of this volume. The first refers to Dr. Fridenberg's paper, p. 66, the second two refer to Dr. Veasey's paper, p. 204.